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no. DOT-
TSC-UMTA-
72-1
v.2

REPORT NO. DOT-TSC-UMTA-72-1

OPERATIONAL DIAL - A - RIDE COMPUTER PROGRAM; VOLUME 2

V. 2 – Test Scenarios and Test Data

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May 27–June 4, 1972

SEPTEMBER 1971
TECHNICAL REPORT

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Prepared for
U.S. DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

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16. Abstract
This report presents the results of the evaluation of the MIT Urban Systems Laboratory's (USL's) Dial-A-Ride operational computer program. The evaluation was carried out by the Transportation Systems Center (TSC) under PPA UM-02, "Transportation Systems Computer Package", FY'72. The general purpose of the evaluation was to test the Operational Dial-A-Ride (O D-A-R) DOS Program against the work statement of November 24, 1970, for extension of the UMTA Grant MASS-MTD-6.

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ACCEPTANCE TEST SPECIFICATION
FOR THE
DOS PROGRAM

JULY, 1971

Acceptance Test Specification for The DOS Program

This acceptance test specification documents the tests to be performed on the Operational Dial-A-Ride (ODAR) computer dispatching program developed by MIT to verify that it meets the specifications in the work statement of 24 November 1970 for UMTA MASS-MTD-6. It is organized as follows:

Section 1	General Test Conditions
Section 2	Acceptance Test Scenarios
Appendix A	Test Hardware Configuration
Appendix B	Test Input Files
Appendix C	Street Map Files
Appendix D	Initialization Procedure
Appendix E	Reference Letters

A complete list of all test scenarios is included in the first section.

Section 1: General Test Conditions

1.1 Hardware

Transportation Systems Center (TSC) will provide, subject to MIT approval, the hardware required for the Acceptance Tests; detailed hardware specifications were provided to TSC on January 14, 1971, and a summary only is presented in Appendix A. TSC will select the 360/50 or the 360/67 for each scenario, according to cost and convenience.

1.2 Software

MIT will supply all specially developed software for ODAR while TSC will supply an IBM Disk Operating System generated according to MIT's specifications with the advice and approval of MIT. An ARDS software package will be supplied by ADAGE, through MIT, for the test.

1.3 Personnel

TSC will provide a computer operator and a maximum of nine ODAR terminal operators as required for each of the tests while USL will provide sufficient personnel to perform all other aspects of the tests. The tests will be under the supervision of MIT personnel except that all data collection and verification will be under the supervision of TSC personnel.

1.4 Data Collection

Data to be collected will consist primarily of the printed sheets at the telecommunications terminals and the computer operator's console. Summary statistics and basic billing information on a computer readable medium will also be provided. Graphic output to the ARDS will not be saved in any form unless TSC chooses to photograph the ARDS screen. Diagnostic trace output on the high-speed printer will also be provided in some cases.

1.5 Changes during Test

During the course of the Acceptance Test, there will be no changes in the software except as necessitated by running on a different machine.

1.6 List of Scenarios Relevant to Work Statement

Scenario Number	Name
I.2.1	Incorporated in I.3.7
I.2.2-A	East-West Distribution Problem
I.2.2-1B	East-West Distribution Problem
I.2.2-2A	Clockwise Distribution Problem #1
I.2.2-2B	Clockwise Distribution Problem #1
I.2.2-2C	Clockwise Distribution Problem #1
I.2.2-3	Clockwise Distribution Problem #2
I.2.2-5	Group-Group Distribution
I.2.2-6	Two-Sector Distribution
I.2.2-7	Four-Section, Four-Vehicle Distribution
I.2.2-8	FCFS Collection #1
I.2.2-9	FCFS Collection #2
I.2.2-11	Branch and Circuit Collection
I.2.2-12	Diamond-Star Collection Problem
I.2.2-13	Many-Two Test
I.2.2-14	Simple Many-Many
I.2.2-15	2-Vehicle Many-to-Many
I.2.3.a	Deliver and Pickup Constraints (Consistency)
I.2.3.b	Deliver and Pickup Constraints (Violation)
I.2.6	Realistic Case (Cambridge)

NOTE: Scenarios Number I.2.2-4, I.2.2-10, I.2.4, and I.2.5 were included in earlier drafts of the acceptance test but have subsequently been either eliminated or included in other scenarios.

I.3.1.A Restart A - Part of I.2.6

I.3.1.B Restart B - Part of I.2.6

I.3.2 Cancellation of Serious Request

I.3.3 Unexpected Situations

I.3.4 Vehicle Breakdown Procedures

I.3.5 Lateness Detection & Correction

I.3.6 Priority Classes

I.3.7 Graphics - Part of I.2.6

I.3.8 Standing Requests - Part of I.2.6

I.3.9 Automatic Billing - Part of I.2.6

I.3.10 Hard Copy of Manual Backup - Part of I.2.6

1.7 Acceptance Criteria

Successful completion of the following scenarios, as determined by TSC on the basis of the data collected, is required for acceptance of the ODAR program in accordance with Section 3.7 of the November 24, 1970, Work Statement: I.2.2-1 through I.2.2-15, except I.2.2-4 and I.2.2-10,; I.2.3.a and I.2.3.b; I.3.1, I.3.2, I.3.3, I.3.4, I.3.5, I.3.6, I.3.7, I.3.8, I.3.9, I.3.10. These scenarios meet the requirements of the Acceptance Test Specification called for in Section 3.6.3.3 of the November 24, 1970, Work Statement.

Section 2

Acceptance Test Scenarios

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: East-West Distribution Problem Number: I.2.2.-1A

Date of Approval: 2 June 1971 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 2

Test Conditions: X OM ___ MO ___ MM ___ MC ___ SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 4

Constraint: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose.

To verify that the computer program will minimize the average arrival time by dropping off two passengers who go to a common destination before dropping off the third passenger who goes to an equally distant destination (see diagram).

Description:

Three passengers are at the origin, 50 50 st. Passenger arnie enters a request for delivery to 100 50 st, then bob and charlie enter requests to go to 100 50 st and 0 50 st, respectively. Vehicle checks in at origin (50 50 st) and is dispatched.

Expected Result:

The passengers will be delivered in an efficient manner.

Reference #: FT02 File No.: 1 (App B)

Initialization Procedure: standard (App D)

Computer Hardware Configuration: (App A)

Street Map File: GRID (App C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and Passenger Console Typeput

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVI

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	Input/OUTPUT
VEHI VEHI	: :	hold 2 local 10 10 ST
		CRS0150 VEH AT ADDRESS
PASS		zero
		10 10 ST
		50 50 ST
VEHI		CRS0105 VEH 0001 P ZERO 10 10 ST
PASS		CRS0000 ZERO VEH0001 P 0 D 4
VEHI		vehil
		CRS0110 VEH 0001 D ZERO 50 50 ST
PASS		arnie
		50 50 ST

Page 2 of 2

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		100 50 ST
		CRS0000 ARNIE VEH 0001 P4 D7
		bob
		50 50 ST
		100 50 ST
		CRS0000 BOB VEH 0001 P4 D7
		charlie
		50 50 ST
		0 50 ST
		CRS0000 CHARLIE VEH 0001 P4 D12
		vehil
		CRS0105 VEH 0001 P ARNIE 50 50 ST
		vehil
		CRS0105 VEH 0001 P BOB 50 50 ST
		vehil
		CRS0110 VEH 0001 D ARNIE 100 50 ST
		vehil
		CRS0110 VEH 001 D BOB 100 50 ST
		vehil
		CRS0105 VEH 0001 P CHARLIE 50 50 ST
		vehil
		CRS0110 VEH 001 D CHARLIE 0 50 ST

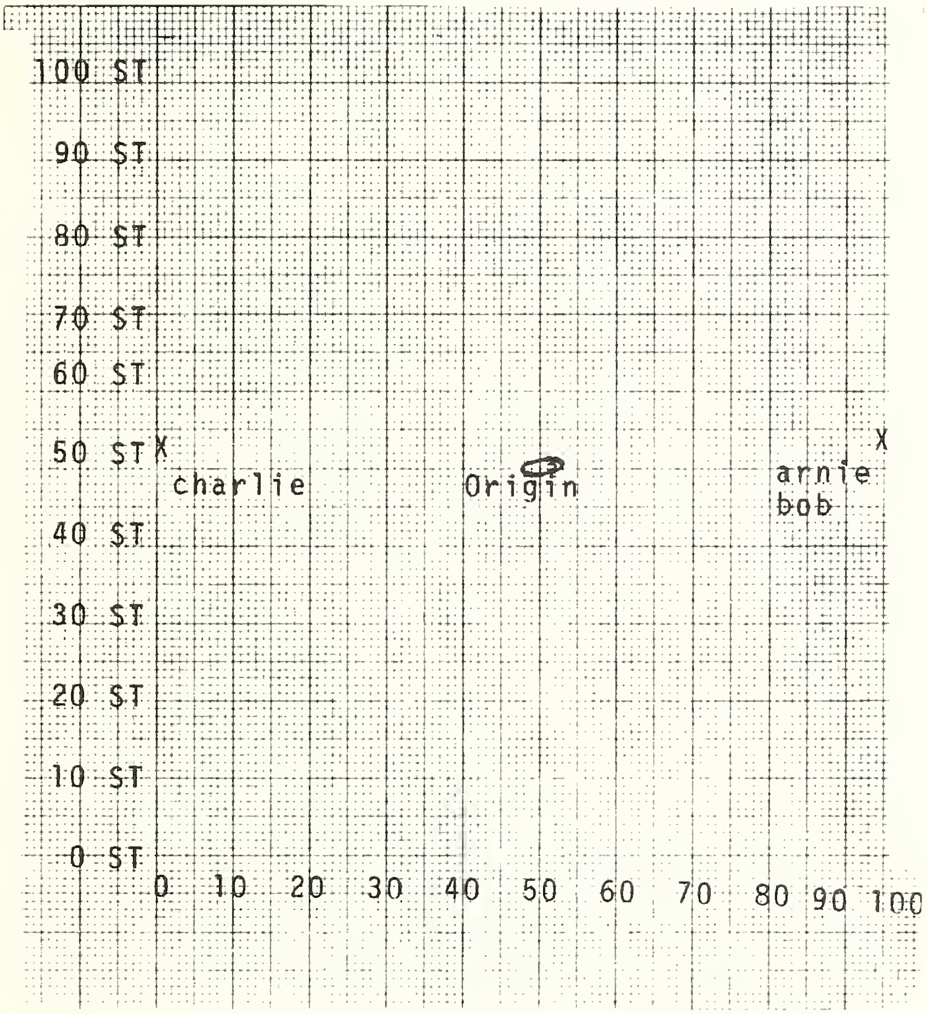
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ______________________________

T. Hyponet's posture: ______ seated ______ standing ______ prone

Diagram:



Rot

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: East-West Distribution Problem Number: I.2.2-1B

Date of Approval: 2 June 1971 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 2

Test Conditions: X OM ___ MO ___ MM ___ MS ___ SM

Number of Vehicles 1 Vehicle Capacity ≥ 3

Mean Vehicle Speed 12 (mph) Number of Riders 3

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the computer program will minimize the average arrival time.

Description:

Three passengers are at the origin, 50 50 st. Passenger arnie enters a request for delivery to 0 50 st, then bob and charlie enter requests to go to 100 50 st. Vehicle checks in at origin (50 50 st) and is dispatched.

Expected Result:

The passengers will be delivered in an efficient manner.

References: FT02 File No.: ____________

Initialization Procedure: ____________

Computer Hardware Configuration: ____________

Street Map File: Grid

Non-Standard Inputs Required: None

Personnel Required: ____________

Output Types: Vehicle and Passenger Console Typeput

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
PASS 1	*00:00:00	arnie
		50 50 st
		0 50 st
	00:00:20	bob
		50 50 st
		100 50 st
	00:00:40	charlie
		50 50 st
		100 50 st
VEHI 1	00:01:00	local0 50 st

*Note 1: The following three requests are entered as rapidly as possible; times shown for them are approximate.

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT

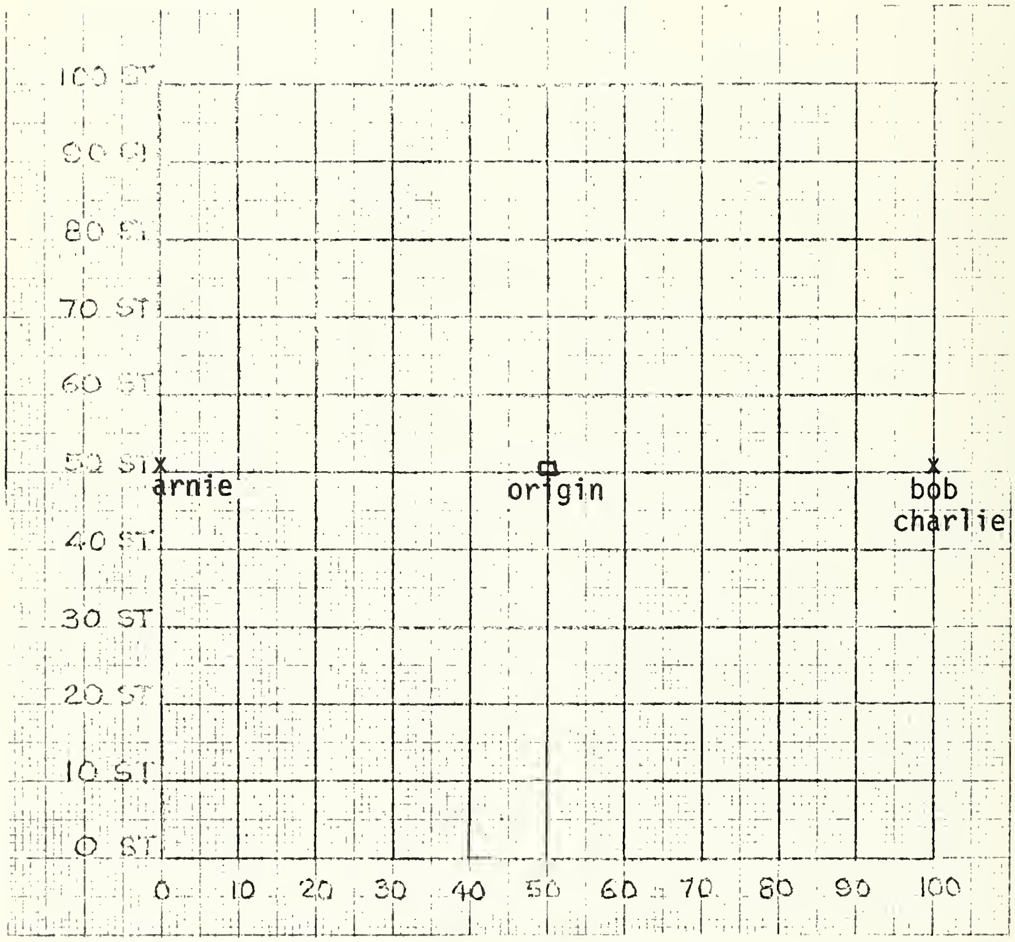
Date Test Run: ______________

Time Test Started: ______________ Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet's posture: _______seated _______standing _______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Clockwise Distribution Problem #1 Number: I.2.2-2A

Date of Approval: 2 June 71 Page 1 of 6

Work Statement References: 3.6.3.3 (page 25) Running Time 6

Test Conditions: x OM ___ MO ___ MM ___ MS ___ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 7

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the computer program will minimize the average travel time by dropping off as many passengers as possible as soon as possible.

Description:

The delivery requests shown in the diagram are entered in alphabetical order. The single bus is located at 0 0 st. (the other vehicle is made ineligible for assignment by using the 'hold' command)

Expected Result:

The bus will be dispatched to deliver the passengers in an efficient manner.

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and Passenger Console Sheets

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:00:00	hold 2
VEHI	00 :00:00	local0 0 0 ST
PASS 1	*00:00:00	arnie
		0 0 st
		100 0 st
	00:00:20	bob
		0 0 st
		0 60 st
	00:00:40	charlie
		0 0 st
		0 100 st
	00:01:00	dan
		0 0 st

Note 1: The following seven requests are entered as rapidly as possible; the times shown for them are approximate.

Page 3 of 6

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		0 90 st
	00:01:20	ed
		0 0 st
		0 80 st
	00:01:40	frank
		0 0 st
		0 70 st
	00:02:00	george
		0 0 st
		100 100 st
VEHI 1	00:03:15	XXXXXX VEH 10 P ARNIE 0 0 ST
		etc.
PASS 1	00:04:00	XXXXXX ARNIE V 10 P 01 D 09
		etc.
VEHI 1	00:05:00	XXXXXX VEH 10 D BOB 0 60 ST
		vehi10
		XXXXXX VEH 10 D FRANK 0 70 ST
		vehi10
		XXXXXX VEH 10 D ED 0 80 ST
		vehi10
		XXXXXX VEH 10 D DAN 0 90 ST

Page 4 of 6

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		vehi10
		XXXXXX VEH 10 D CHARLIE 100 ST
		vehi10
		etc.

Page 5 of 6

Date Test Run: ______

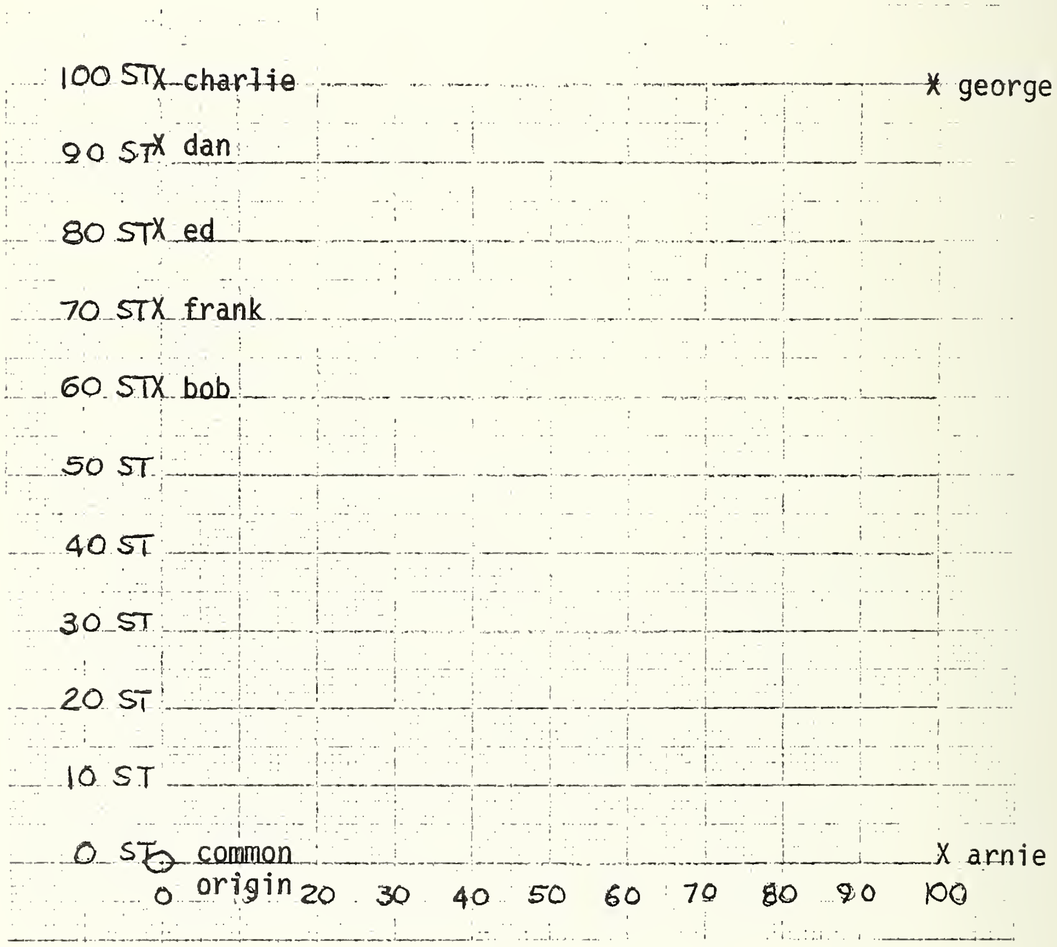
Time Test Started: ______

Time Test Ended: ______

Data Taken by: ______

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Clockwise Distribution Problem #1 Number: I.2.2-2B

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 6

Test Conditions: X OM ___ MO ___ MM ___ MS ___ SM

Number of Vehicles 2 Vehicle Capacity 7

Mean Vehicle Speed 12 (mph) Number of Riders 7

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the computer program will minimize the average travel time by dropping off as many passengers as possible as soon as possible.

Description:

The delivery requests shown in the diagram are entered in alphabetical order.

Expected Result:

The buses will be dispatched to deliver the passengers in an efficient manner.

References: FT02 File No.: 1

Initialization Procedure: ____

Computer Hardware Configuration: ____

Street Map File: Grid

Non-Standard Inputs Required: None

Personnel Required: ____

Output Types: Vehicle and Passenger Console Sheets

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
PASS	*00 . 00. 00	
		arnie
		0 0 st
		100 0 st
	00:00:20	bob
		0 0 st
		100 100 st
	00:00:40	charlie

NOTE: The following seven requests are entered as rapidly as possible; the times shown for them are appropriate

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		0 0 st
		0 100 st
	00:01:00	dan
		0 0 st
		0 90 st
	00:01:20	ed
		0 0 st
		0 80 st
	00:01:40	frank
		0 0 st
		0 70 st
	00:02:00	george
		0 0 st
		0 60 st
VEHI 1	00:03:15	XXXXXX VEH 1 P ARNIE 0 0 ST
		etc.
PASS 1	00:04:00	XXXXXX ARNIE V 10 P 01 D 09
		etc.
VEHI 1	00:05:00	XXXXXX VEH 1 D 0 60 ST
		vehil
		XXXXXX VEH 1 D FRANK 0 70 ST

Page 4 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		vehil
		XXXXXX VEH 1 D ED 0 80 ST
		vehil
		XXXXXX VEH 1 D DAN 0 90 ST
		vehil
		XXXXXX VEH 1 D CHARLIE 0 100 ST
		vehil

Page 5 of 5

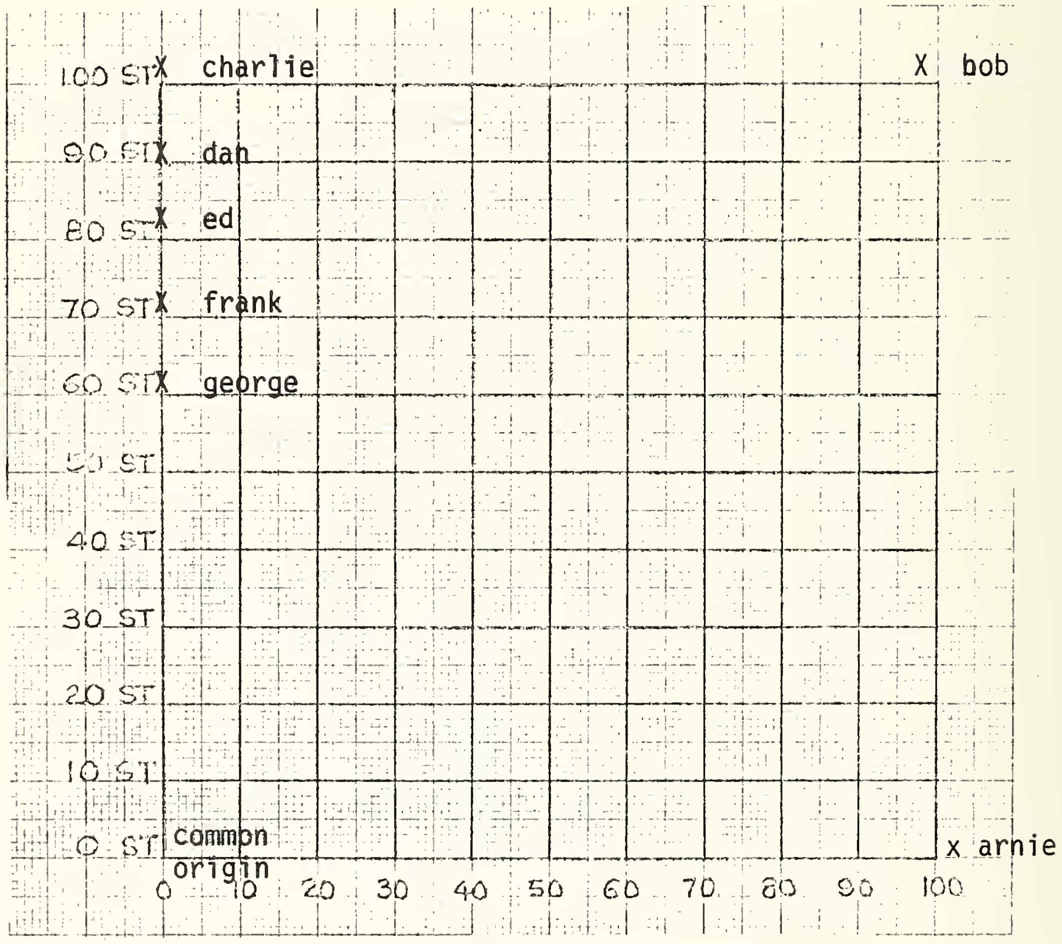
Date Test Run: ______________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ______________________________

T. Higonnet"s posture: _______seated _______standing _______prone

Diagrams:



Notes:

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Clockwise Distribution Problem #1 Number: 1.2.2-2C

Date of Approval: 2 June 71 Page 1 of 4

Work Statement References: 3.6.3.3 (page 25) Running Time .6

Test Conditions: X OM ___ MO ___ MM ___ MC ___ SM

Number of Vehicles 1 Vehicle Capacity 7

Mean Vehicle Speed 12 (mph) Number of Riders 7

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the computer program will minimize the average travel time by dropping off as many passengers as possible as soon as possible.

Description:

The delivery requests shown in the diagram are entered in alphabetical order. Vehicle two will be held.

Expected Result:

The bus will be dispatched to deliver the passengers in an efficient manner. Bus will then be unassigned.

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure:

Computer Hardware Configuration:

Street Map File: Grid

Non-Standard Inputs Required: None

Personnel Required:

Output Types: Vehicle and Passenger Console Sheets

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
PASS 1	*00 : 00: 00	
VEHI		loca 001 0 0 ST
		hold0002
PASS		arnie
		0 0 st
		100 0 st
	00:00:20	bob
		0 0 st
		100 100 st
	00:00:40	charlie

NOTE: The following seven requests are entered as rapidly as possible; the times shown for them are appropriate.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		0 0 st
		0 100 st
	00:01:00	dan
		0 0 st
		0 90 st
	00:01:20	ed
		0 0 st
		0 80 st
	00:01:40	frank
		0 0 st
		0 70 st
	00:02:00	george
		0 0 st
		0 60 st

NOTE: The computer program will now dispatch the vehicles and the tour will be observed.

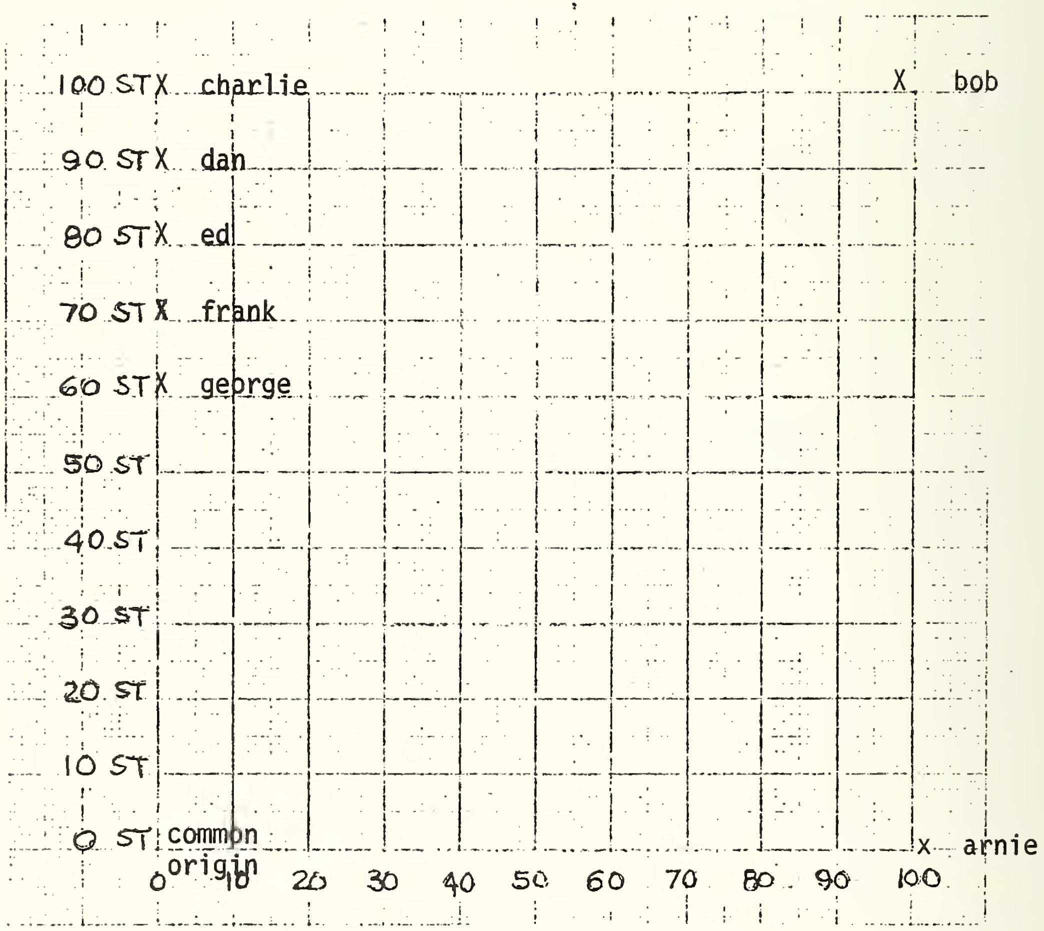
Date Test Run: ______________

Time Test Started: ______________ Time Test Ended: ______________

Data Taken by: ________________________________

T. Higonnet's posture: _______seated _______standing _______prone

Diagrams:



Notes:

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Clockwise Distribution Problem #2 Number: I.2.2-3

Date of Approval: 2 June 71 Page 1 of 6

Work Statement References: 3.6.3.3 (page 25) Running Time 6

Test Conditions: x CM ___ MO ___ MM ___ MC ___ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 7

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine that the computer program will deliver three passengers nearby before delivering two others to more distant destinations; and that it will react sensibly when origin and destination are coincident.

Description:

All origins are at 0 0 st. Passengers bob, charlie, dan, ed and frank have destinations remote from 0 0 st, as shown in the diagram, while passengers arnie and george request destinations at 0 0 st. Requests are entered in alphabetical order. Vehicle 2 is held so that only one vehicle is available for assignment.

Expected Result:

The bus will immediately deliver arnie and george, then tour to deliver bob, ed, dan, charlie and frank in that order.

Reference: FT02 File No.: 1, App. B

Initialization Procedure: Standard (App D)

Computer Hardware Configuration:

Street Map File: Grid (App C)

Non-Standard Inputs Required: Minimum Trip of 0.0 Miles

Personnel Required: Standard

Output Types: typewritten, on passenger and vehicle consoles

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
VEHI	00:00:00	hold 2
VEHI	00 :00:00	local 0 0 ST
PASS 1	*00:00:00	arnie
		0 0 st
		0 0 st
	00:00:20	bob
		0 0 st
		0 100 st
	00:00:40	charlie
		0 0 st
		100 100 st
	00:01:00	dan
		0 0 st

Note 1: The following seven requests are entered as rapidly as possible; times shown for them are approximate.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		0 100 st
	00:01:20	ed
		0 0 st
		0 100 st
	00:01:40	frank
		0 0 st
		100 0 st
	00:02:00	george
		0 0 st
		0 0 st
		XXXXXX VEH 00001 P ARNIE 0 0 ST
		XXXXXX VEH 00001 P BOB 0 0 ST
		XXXXXX VEH 00001 P CHARLIE 0 0 ST
		XXXXXX VEH 00001 P DAN 0 0 ST
		XXXXXX VEH 00001 P ED 0 0 ST
		XXXXXX VEH 00001 P FRANK 0 0 ST
		XXXXXX VEH 00001 P GEORGE 0 0 ST
		XXXXXX VEH 00001 D ARNIE 0 0 ST
		XXXXXX VEH 00001 D GEORGE 0 0 ST
		XXXXXX VEH 00001 D BOB 0 100 ST
		XXXXXX VEH 00001 D ED 0 100 ST

Page 4 of 6

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		XXXXXX VEH 00001 D DAN 0 100 ST
		XXXXXX VEH 00001 D CHARLIE 100 100 ST
		XXXXXX VEH 00001 D FRANK 0 100 ST

Date Test Run: ______________

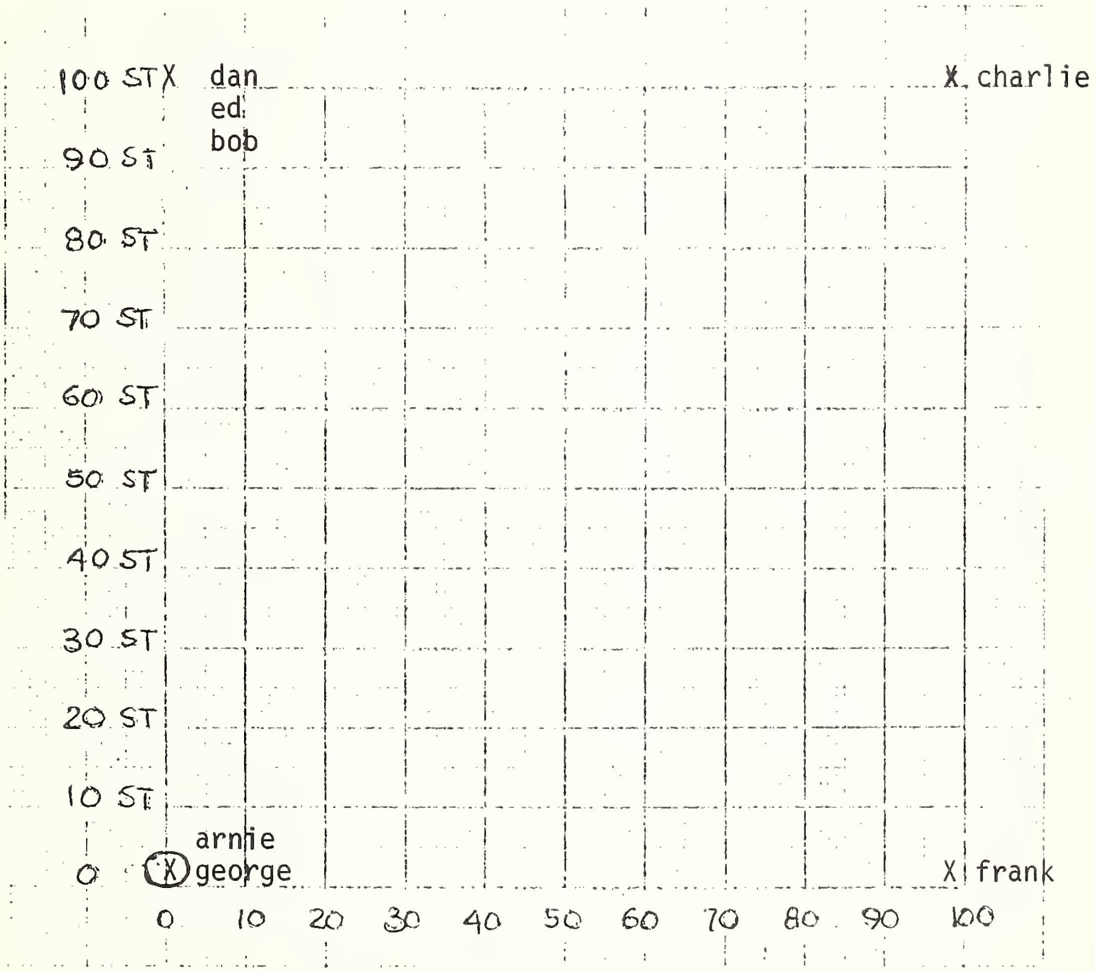
Time Test Started: ______________

Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet's posture: ________seated ________standing ________prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Group-Group Distribution Number: I.2.2-5

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 8

Test Conditions: X OM ___ MO ___ MM ___ MC ___ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 8

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the computer will drop off the nearer of two groups before depositing the farther group.

Description:

Customers request delivery in alphabetical order, as shown in diagram. The vehicle is located at the depot and is assigned to deliver both groups of people. (Vehicle 2 is excluded from assignment for the test by use of the 'hold' command, so that only vehicle 1 is available for assignment)

Expected Result:

The vehicle will be routed so as to deliver the nearer group first.

Initialization Procedure: (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (App C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Type: Typewritten, from vehicle and passenger consoles.

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
VEHI	00:00:00	hold 2
PASS 1	*00:00:00	arnie
		0 10 st
		40 80 st
	00:00:20	bob
		0 10 st
		60 80 st
	00:00:40	charlie
		0 10 st
		70 80 st
	00:01:00	dan
		0 10 st
		70 10 st

*Note 1: The following eight requests are entered as rapidly as possible; the times shown for them are approximate.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: From Start	Input/OUTPUT
	00:01:20	ed
		0 10 st
		60 10 st
	00:01:40	frank
		0 10 st
		70 0 st
	00:02:00	george
		0 10 st
		70 90 st
	00:02:20	henry
		0 10 st
		60 0 st
VEHI	00:05:00	local0 0 10 st

Date Test Run: ______________

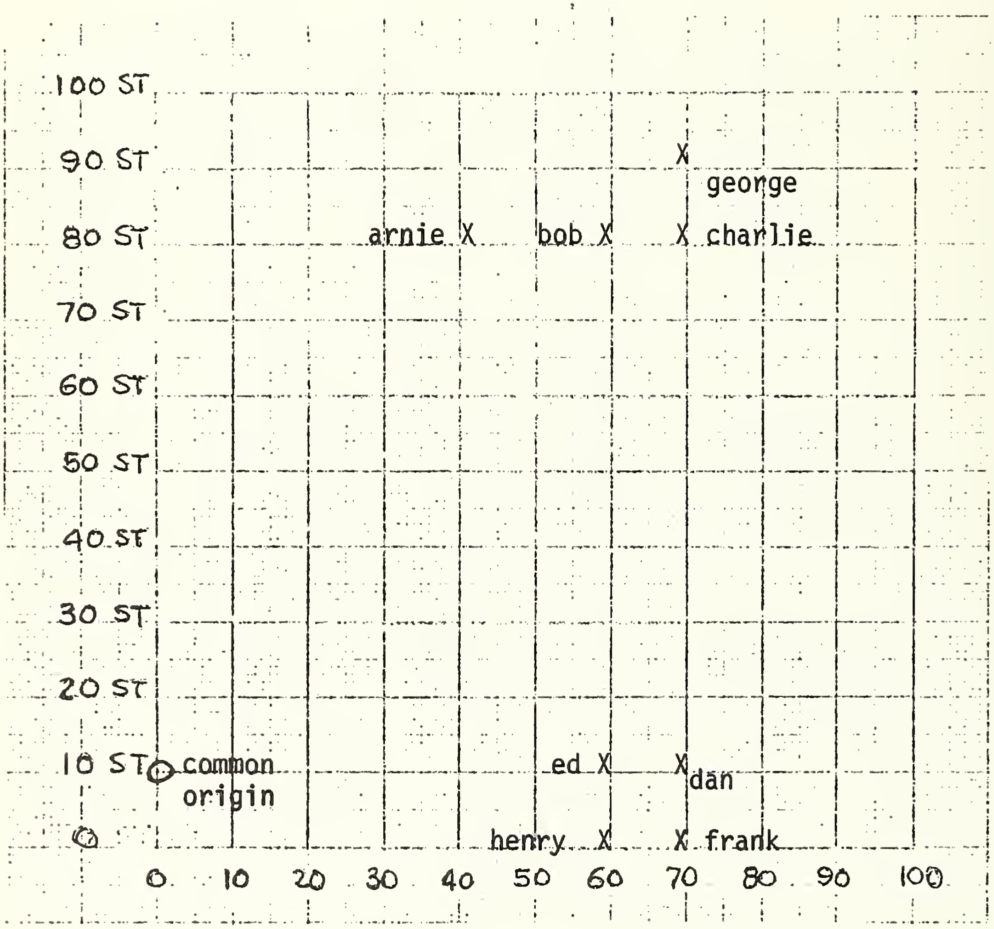
Time Test Started: ______________

Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Page 5 of 5

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Two-Sector Distribution Number: I.2.2-6

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 8

Test Conditions: X OM ___ MO ___ MM ___ MS ___ SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 8

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine that the computer will assign one bus to deliver a group to the northeast, and another bus to deliver a similar group to the southwest.

Description:

(a) The two vehicles check in at the depot (50 50 st). Then the deliveries shown in the diagram are entered in alphabetical order.

(b) Same as a) except the vehicles are located at 70 80 st and 90 80 st before the requests.

Expected Result:

One vehicle delivers to the northeast, the other to the southwest.

References: FT02 File No.: #1 (Appendix B) Page 2 of 5

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Typewritten, from vehicle and passenger consoles

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
a) VEHI 1	00 : 00: 0	local 50 50 st
		loca2 50 50 st
PASS 1	*00:01:00	arnie
		50 50 st
		100 100 st
	00:01:20	bob
		50 50 st
		100 90 st
	00:01:40	charlie
		50 50 st
		10 0 st
*Note 1: The following 8 requests entered as rapidly as possible; times shown for them are approximate.		dan 50 50 st 50 0 st ed 50 50 st 50 100 st

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
	00:02:40	frank
		50 50 st
		0 10 st
	00:03:00	george
		50 50 st
		0 0 st
	00:03:20	hank
		50 50 st
		90 100 st

Note 2: The vehicles will now be dispatched by the computer.

b) PASS 1	00:00:00	arnie
		50 50 st
		⋮
		same as a)
		⋮
		hank
		50 50 st
		90 100 st
VEHI 1	00:04:00	loca1 50 50 st
		loca2 50 50 st

Note 3: The vehicles will now be dispatched by the computer.

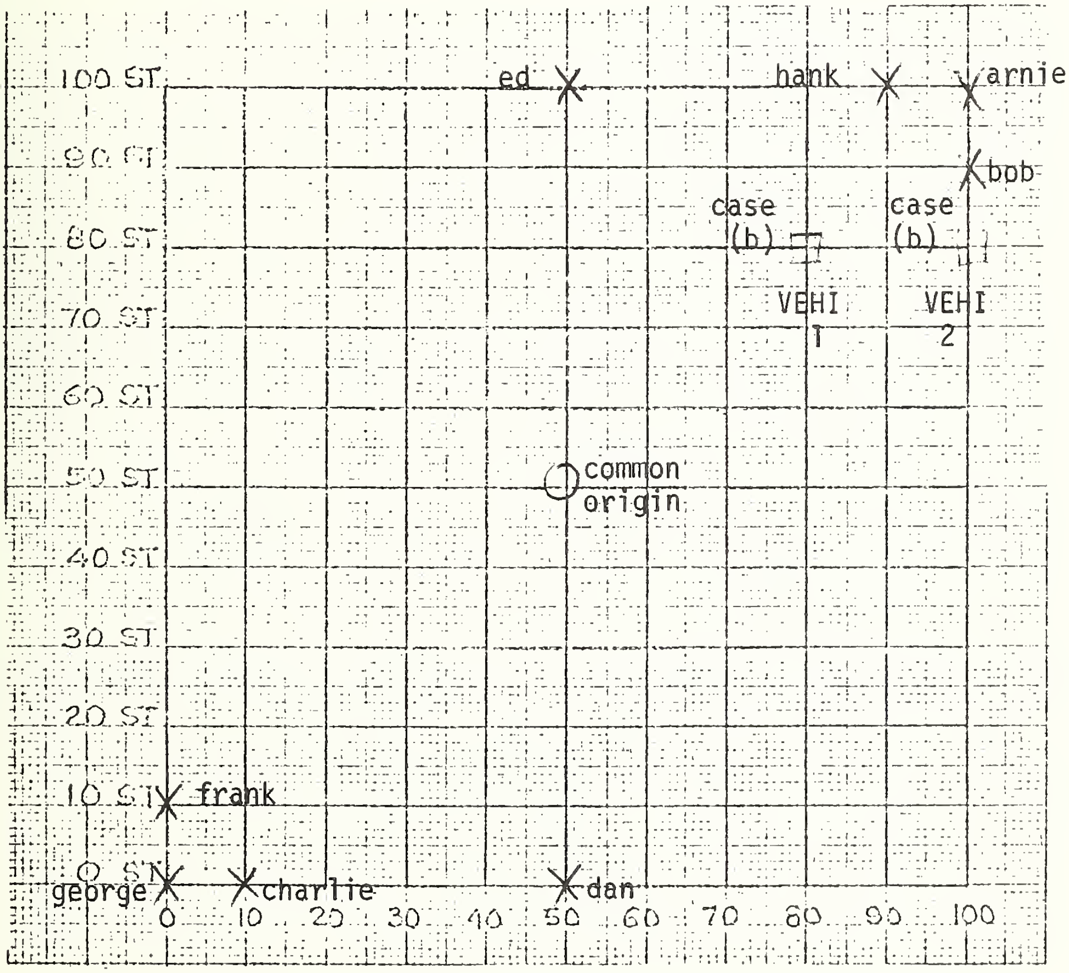
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ______________________________

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: 4 Sector, 4 vehicle Distribution Number: I.2.2-7

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time :15

Test Conditions: x OH ___ MO ___ MM ___ HC ___ SM

Number of Vehicles 4 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 10

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To ascertain that, when four vehicles are available, each will be assigned to deliver one of four groups of passengers.

Description:

Passenger requests as shown in the diagram will be entered in alphabetical order and then the vehicles located at the depot (50 50 st).

Expected Result:

One bus will be dispatched to deliver each of the four groups of passengers.

Initialization Procedure: (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required:

Personnel Required: 3

Output Type: Console typeout

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	: :	loca1 50 50 st
		loca2 50 50 st
		loca3 50 50 st
		loca4 50 50 st
PASS 1	*00:00:00	arnie
		50 50 st
		100 100 st
	00:00:20	bob
		50 50 st
		100 0 st
	00:00:40	charlie

Note 1: The following ten requests are entered as rapidly as possible; times shown for them are approximate.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		50 50 st
		0 0 st
	00:01:00	dan
		50 50 st
		100 10 st
	00:01:20	ed
		50 50 st
		0 100 st
	00:01:40	frank
		50 50 st
		30 70 st
	00:02:00	george
		50 50 st
		0 10 st
	00:02:20	hank
		50 50 st
		90 100 st
	00:02:40	ira
		50 50 st
		0 30 st
	00:03:00	joe
		50 50 st
		90 0 st

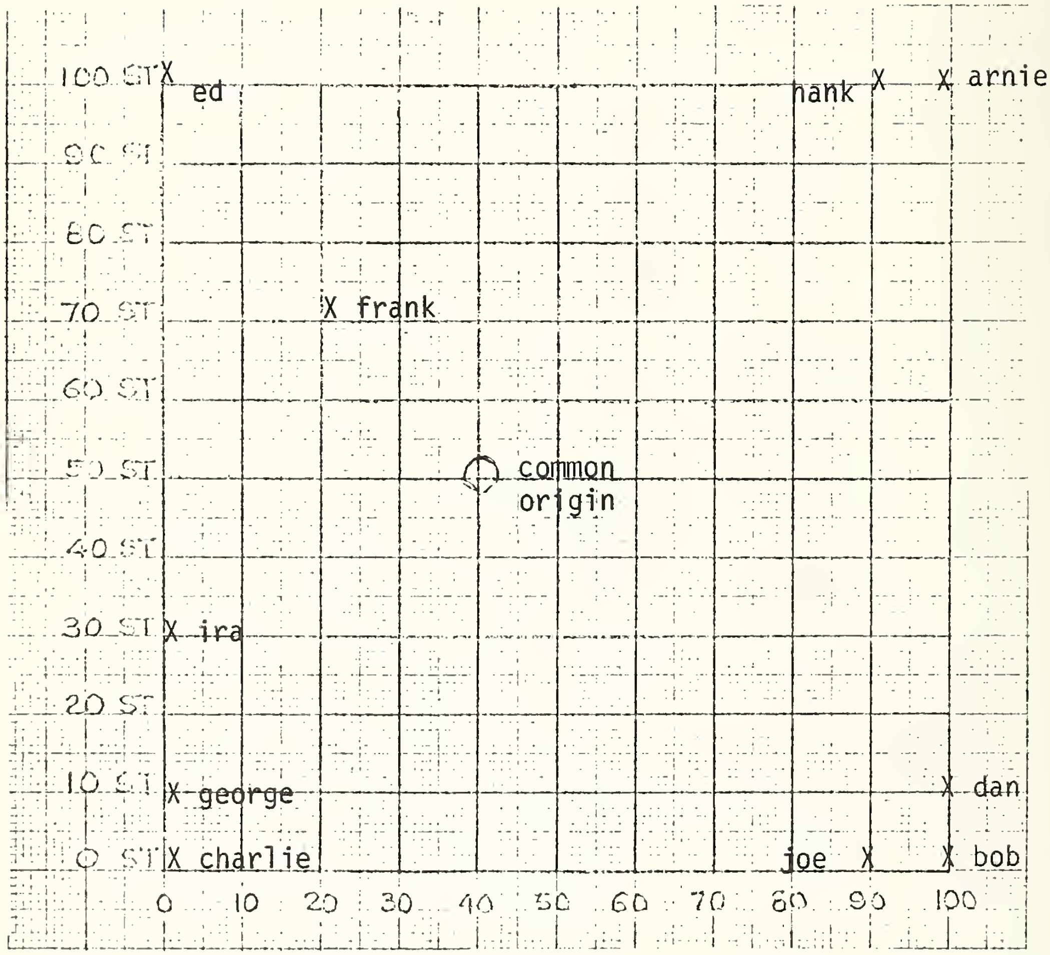
Date Test Run: ______________

Time Test Started: ______________ Time Test Ended: ______________

Data Taken by: ________________________________

T. Bigonnet"s posture: ________seated ________standing ________prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: FCFS Collection #1 Number: I.2.2-8

Date of Approval: 2 June 1971 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 7

Test Conditions: ____OM X MO ____MM ____MS ____SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 2

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine whether, if two pick-ups are located equally distant from the bus, the one that submitted his request first will be serviced first.

Description:

The pick-up request by arnie is entered. Five minutes later that by bob is entered. They are situated as shown in the diagram (page 6). After bob's request is entered the bus reports to the collection point and is dispatched. Vehicle 2 is excluded from assignment during the test by use of the 'hold' command.

Expected Result:

Because he called in first, arnie should be picked up and delivered to the collection point; then bob is serviced.

Page 2 of 5

References: FT02 File No.: 1 (Appendix B

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: GRID (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and passenger terminal typeout

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEH 1		hold 2
PASS 1	00:00:00	arnie
		0 50 st
		50 50 st
	00:05:00	bob
		100 50 st
		50 50 st
VEHI 1	00:06:00	local 50 50 st

Note 1: The vehicle dispatching occurs now.

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT

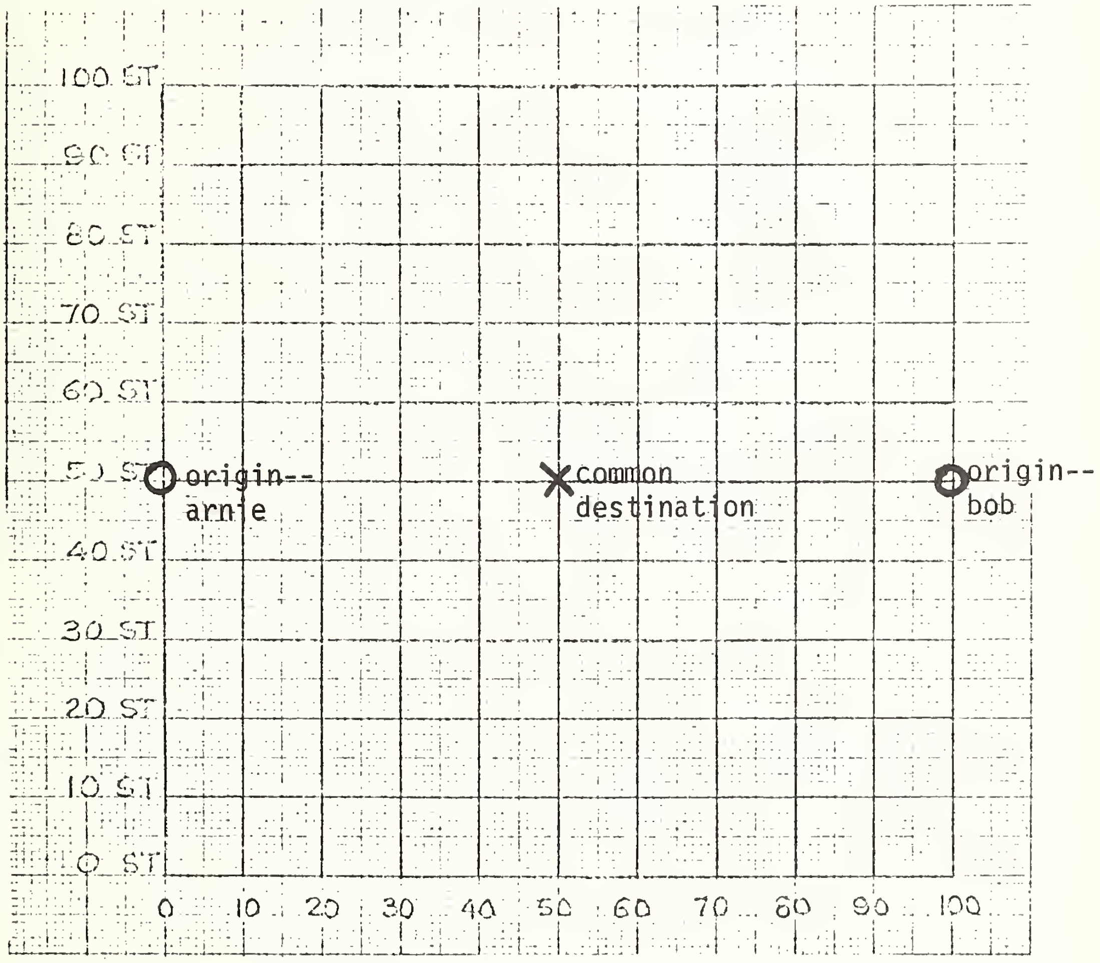
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ____________________________

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: FCFS Collection #2 Number: I.2.2-9

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 8

Test Conditions: ___ OM X MO ___ MM ___ MS ___ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 4

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine whether customers who have been waiting longer will be collected first, all other things being equal.

Description:

This scenario is a slight generalization of I.2.2-8. Customers arnie and charlie call in their requests sooner, on the average, than bob and dan. Hence, the bus should pick them up first. See diagram.
Vehicle 2 is excluded from assignment during the test by use of the 'hold' command.

Expected Result:

The bus will be dispatched to pick up charlie and arnie, deliver them to 50 50 st, and then to collect dan and bob.

Page 2 of 5

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: GRID (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and passenger terminal typeout

Display Equipment Required: none

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEH 1 PASS 1	00 :00: 00	hold 2 arnie
		0 50 st
		50 50 st
	00:02:00	bob
		100 50 st
		50 50 st
	00:04:00	charlie
		20 50 st
		50 50 st
	00:06:00	dan
		80 50 st
		50 50 st
VEHI 1	00:07:00	local 50 50 st
Note 1:	00:08:00	Vehicle dispatching now occurs.

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT

Page 4 of 5

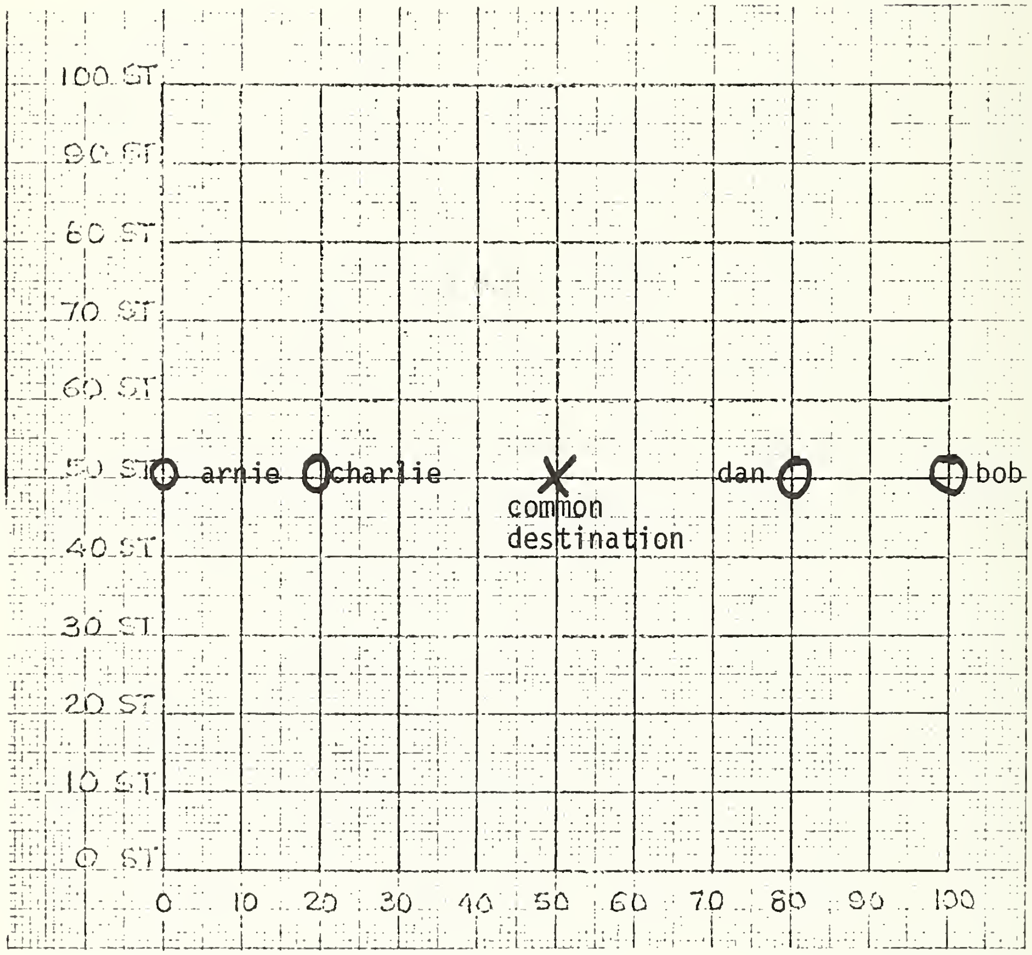
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Branch and Circuit Collection Number: I.2.2-11

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 30

Test Conditions: ____ OM X MO ____ MM ____ MS ____ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 3

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine that the heuristic produces a circuitous tour or branching tour, depending on which minimizes the criterion (tour time plus total of delivery times) for a two-passenger collection problem.

Description:

Arnie and bob request pick-up and delivery from different origins to 20 0 st. The bus is located at 20 0 st, dispatched, and collection completed. The test is repeated using different origins for bob, as shown by the letters (a) through (n) in the diagram, page 4. Vehicle 2 is excluded from assignment during the test by use of the hold command.

Expected Result:

The results will be tours that minimize the criterion, allowing 30 seconds each stop for boarding and disembarking of passengers.

References: FT02 File No.: 1 (Appendix B) Page 2 of 5

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: GRID (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and passenger terminal typeout

Display Equipment Required: none

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
(a) VEHI 1	00:00:00	local 0 0 st
VEHI 1	00:00:05	hold 2
PASS 1	00:00:10	dummy
		0 0 st
		20 0 st
VEHI 1	00:00:15	XXXXXX CRS0105 VEH 0001 P DUMMY 0 0 ST
		XXXXXX CRS0110 VEH 0001 D DUMMY 20 0 ST
VEHI		VEHI 1
PASS 1	00:00:30	arnie
		40 0 st
		20 0 st
Note 1: The following request is entered immediately after arnie's		
PASS 1		bob
		20 30 st
		20 0 st

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
Note 2:	The vehicle dispatches occur here and all requests are cleared.	
(b) thru (n)	The input/output sequence of (a) is repeated 13 times, each time with a different origin for bob. The following lines replace the line following the entry "bob" in (a):	
	(b)	30 30 st
	(c)	40 30 st
	(d)	50 30 st
	(e)	60 30 st
	(f)	70 30 st
	(g)	80 30 st
	(h)	40 20 st
	(i)	70 20 st
	(j)	10 10 st
	(k)	20 10 st
	(l)	70 10 st
	(m)	80 10 st
	(n)	90 10 st

Page 4 of 5

Date Test Run: ______________

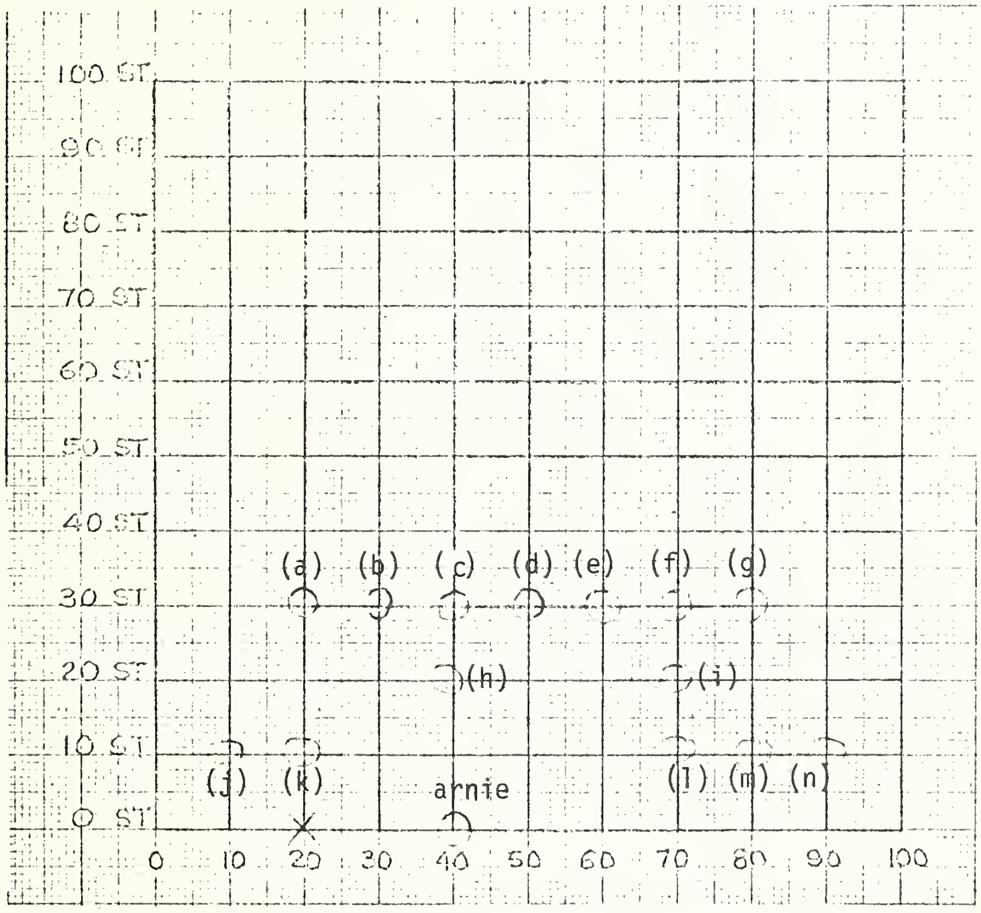
Time Test Started: ______________

Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet"s posture: _______seated _______standing _______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Diamond-Star Collection Problem   Number: I.2.2-12

Date of Approval: 2 June 71   Page 1 of 5

Work Statement References: 3.6.3.3 (page 25)   Running Time 5

Test Conditions: ___ OM   X MO   ___ MM   ___ MS   ___ SM

Number of Vehicles 1   Vehicle Capacity 8

Mean Vehicle Speed 12 (mph)   Number of Riders 4

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To check that the heuristic will route the one vehicle to perform four collections in the most efficient manner, when the collections are situated north, east, west and south.

Description:

Almost simultaneous collection requests to a common point come in from customers situated to the north, east, west and south of the collection point (see diagram). A single vehicle starts from the center and collects all. Vehicle 2 is excluded from assignment by use of "hold" command.

Expected Result:

The vehicle will pick up and deliver the passengers one at a time; first arnie, then charlie, then bob, then dan. Interchanging arnie and charlie and/or bob and dan will not change the value of the objective function. The resultant star pattern is superior to any other, including the diamond shaped tour: arnie, bob, charlie, dan.

Page 2 of 5

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure: standard (Appendix B)

Computer Hardware Configuration: Appendix A

Street Map File: GRID (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and passenger terminal typeout

Display Equipment Required: none

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEH 1	00:00:00	hold 2 local 1 50 50·st
PASS 1	00:00:00	arnie
		70 50 st
		50 50 st
		bob
		50 90 st
		50 50 st
		charlie
		30 50 st
		50 50 st
		dan
		50 10 st
		50 50 st

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
Note: 1	The above requests are entered in rapid succession	
Note 2:	The vehicle will be dispatched now.	

Date Test Run: ______________

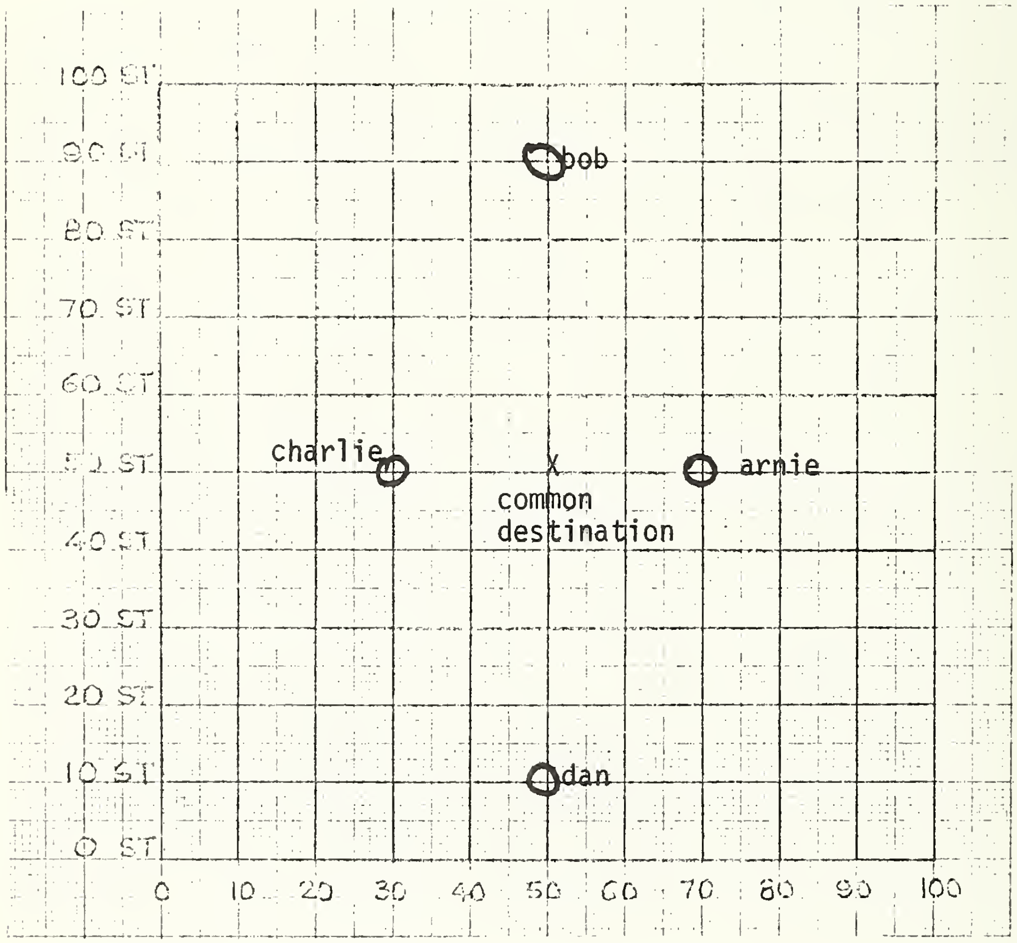
Time Test Started: ______________

Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet's posture: ________seated ________standing ________prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Many-Two Test Number: I.2.2-13

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: ________ Running Time 8

Test Conditions: ____OM ____MO ____MM X MS ____SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 7

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To determine that the heuristic can sort out many requests into a group that goes to one destination, and another group going to another destination, and assign two buses appropriately. See diagram.

Description:

(a) The two vehicles are located equidistantly from 50 50 st. Seven requests with origins near 50 50 st are entered as shown in the diagram. Destinations either to the north (50 100 st) or south (50 0 st). The vehicles are then dispatched.

(b) The test is repeated with the 50 100 st destination changed to 100 100 st, and the 50 0 st destination changed to 0 100 st.

Expected Result:

One bus will pick up arnie, bob, frank and george and deliver them to (a) 50 100 st or (b) 100 100 st. The other bus will pick up charlie, dan and ed and deliver them to (a) 50 0 st or (b) 0 100 st.

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Vehicle and Passenger Terminal Typeout

Display Equipment Required: none

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
(a) VEHI 1	00:00:00	local 0 50 st
		loca2 100 50 st
	00:00:20	arnie
		50 50 st
		50 100 st
		bob
		60 50 st
		50 100 st
		charlie
		70 50 st
		50 0 st

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		dan
		60 60 st
		50 0 st
		ed
		50 60 st
		50 0 st
		frank
		40 60 st
		50 100 st
		george
		50 40 st
		50 100 st

Note 1: The vehicles are dispatched.

(b) The test is repeated with 50 100 st changed to 100 100 st, and 50 0 st changed to 0 100 st.

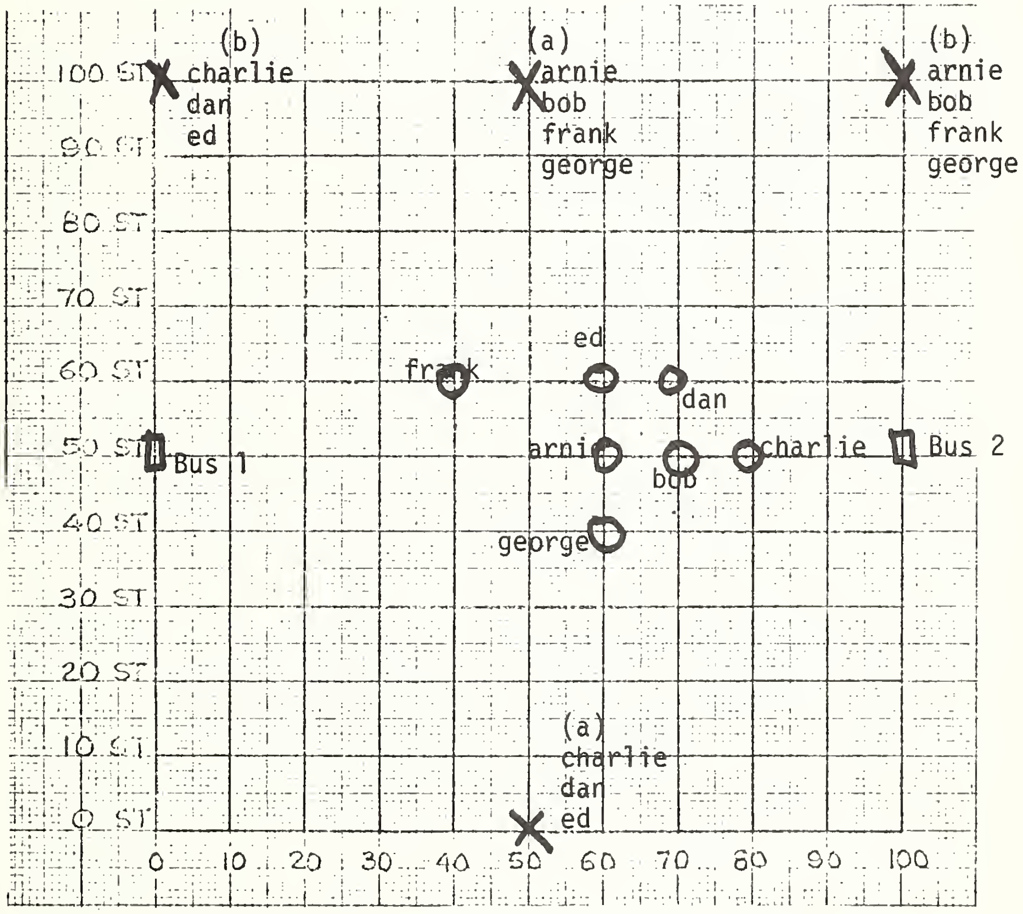
Date Test Run: ______________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ____________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Page 5 of 5

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Simple Many-Many Number: I.2.2-14

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: . Running Time 1

Test Conditions: ___ OM ___ MO X MM ___ MS ___ SM

Number of Vehicles 1 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 3

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that the heuristic will select the minimum cost tour to service two requests by one bus, given a simple configuration for the origins and destinations.

Description:

The two requests shown in the diagram are entered. The bus reports in to 0 0 st and is dispatched. Vehicle 2 is excluded from assignment during the test by use of the 'hold' command.

Expected Result:

The minimum cost tour (criterion 4) is pick up bob, deliver bob, pick up arnie, deliver arnie.

References: FT02 File No.: #1 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Console printout

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI 1	00:00:00	hold 2
PASS 1	00:00:00	dummy
		0 10 st
		0 0 st
VEHI 1	00:00:10	vehil
		XXXXXX VEH 0001 D DUMMY 0 0 ST
PASS 1	00:00:30	arnie
		60 0 st
		60 40 st
		bob
		40 0 st
		20 0 st

* Note 1: The vehicle is now located at 0 0 st and dispatched.
VEHI 1 00:00:40 vehil

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: From Start	INPUT/OUTPUT

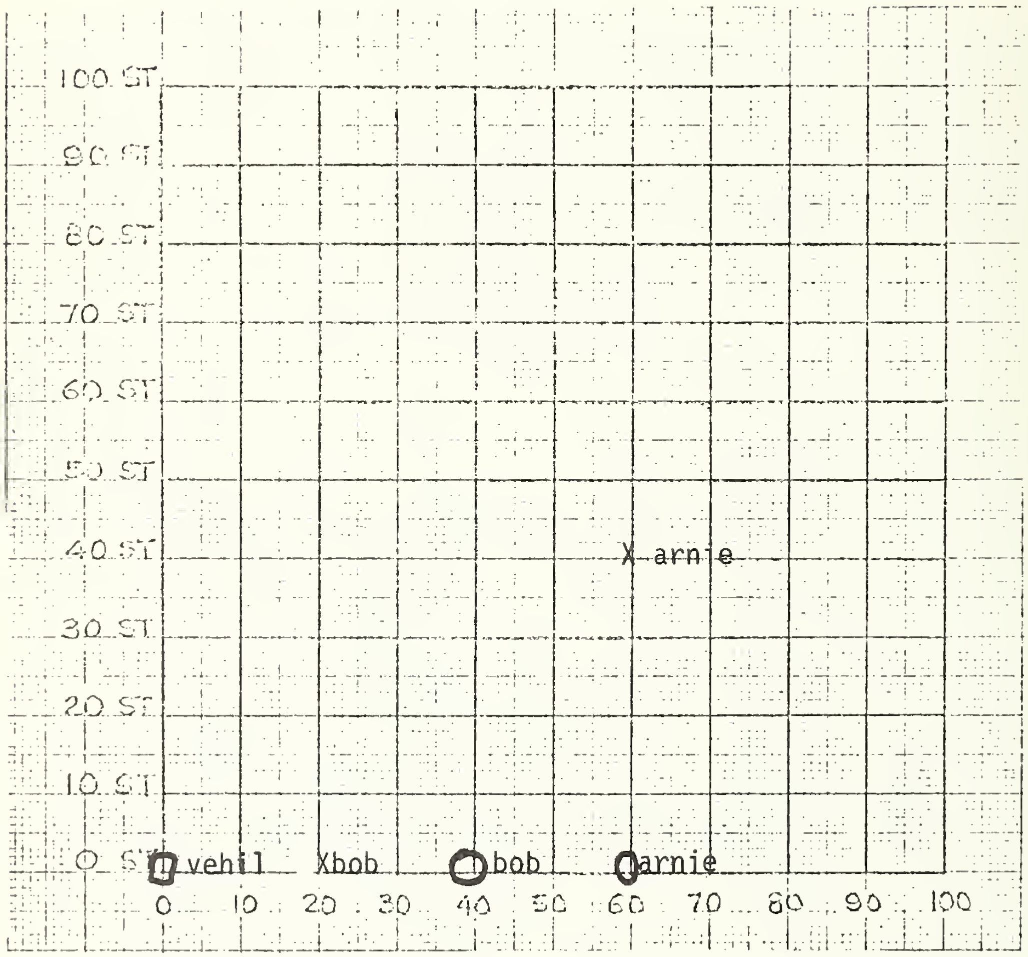
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: 2-Vehicle Many/Many Number: I.2.2-15

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.6.3.3 (page 25) Running Time 16

Test Conditions: ____ OM ____ MO x MM ____ MS ____ SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 8

Constraints: Waiting Time = 60 (min.)

Travel Time = 1 D + 60 (min.)

Total Time = 1 D + 60 (min.)

Purpose:

To verify that one vehicle will be dispatched to service a group of O-D's in the northeast, and the other to service a group in the southwest, when only two vehicles are available.

Description:

(a) The two vehicles are located at 50 50 st and then the requests shown in the diagram are entered in alphabetical order.

(b) The requests are entered before the vehicles complete prior tours which leave them at 50 50 st.

Expected Result:

One vehicle will be dispatched to service charlie, dan, ed, george; the other will service arnie, bob, frank, hank.

Page 2 of 5

References: FT02 File No.: ____________

Initialization Procedure: standard

Computer Hardware Configuration: Appendix A

Street Map File: Grid

Non-Standard Inputs Required: None

Personnel Required: standard

Output Types: Console printouts

Display Equipment Required: none

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ____ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
(a) VEHI 1	00:00:00	local 50 50 st
		loca2 50 50 st
PASS 1	00:00:10	arnie
		50 50 st
		10 0 st
		bob
		10 10 st
		50 50 st
		charlie
		100 90 st
		50 50 st

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		dan
		50 50 st
		70 90 st
		ed
		50 50 st
		90 100 st
		frank
		0 10 st
		50 50 st
		george
		100 100 st
		90 90 st
		hank
		0 0 st
		50 50 st
(b) VEHI 1	00:00:00	local 40 50 st
		loca2 60 50 st
PASS 1	00:00:20	dummy1
		40 50 st
		50 50 st
		dummy2
		60 50 st
		50 50 st

cont'd on next page. bottom

Page 4 of 5

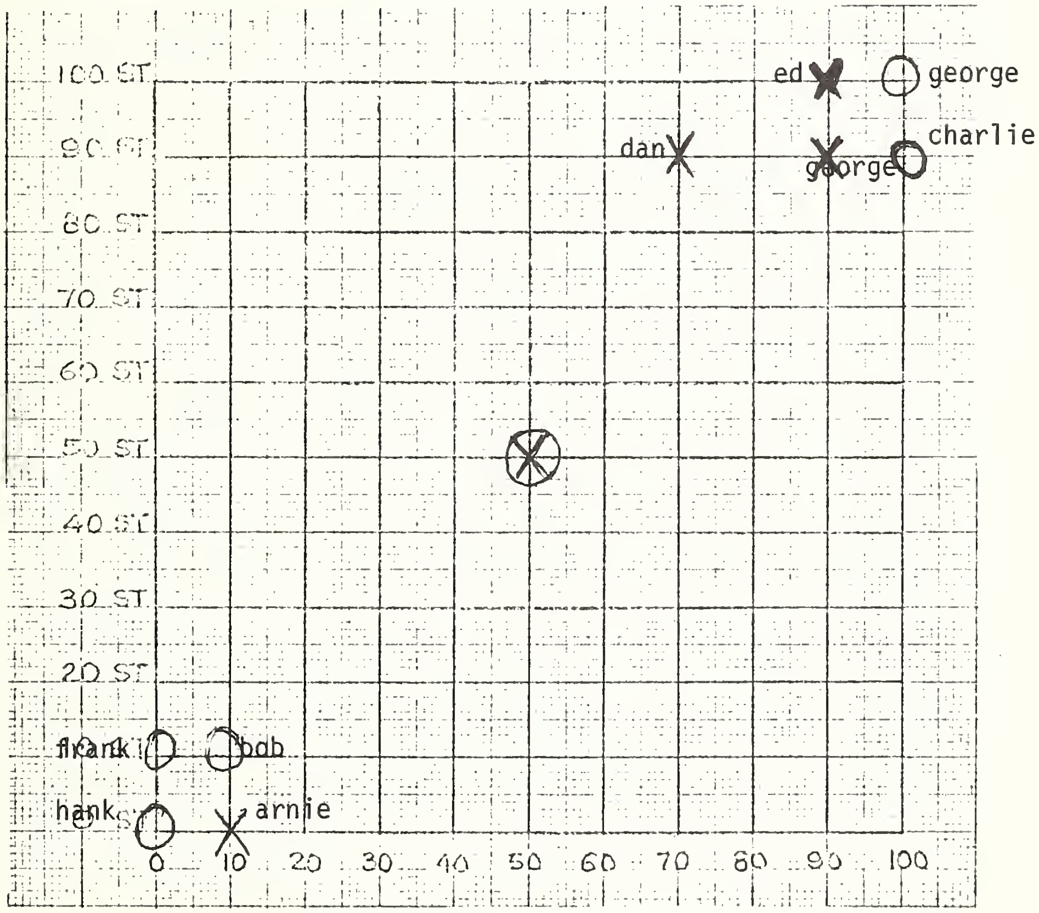
Date Test Run: ______________

Time Test Started: ______________ Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet"s posture: _______seated _______standing _______prone

Diagrams:



Notes: (cont'd)

Note 1: The vehicles are dispatched to deliver the dummies. Then the requests of arnie through hank are entered into PASS 1 as above. Then the following is entered on the vehicle console.

```
VEHI 1   00:10:00   vehi1
                    vehi2
```

Note 2: At this point the vehicles are dispatched by the computer.

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: DELIVERY & PICKUP CONSTRAINTS (CONSISTENCY) Number: I.2.3a

Date of Approval: 2 June 71 Page 1 of 12

Work Statement References: 3.6.3.3 (page 25) Running Time 68

Test Conditions: ____ OM ____ MO X MM ____ MS ____ SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 15 (mph) Number of Riders 20

Constraints: Waiting Time = 30 (min.)

Travel Time = 1.5 D + 25 (min.)

Total Time = 1.5 D + 30 (min.)

Purpose:

To demonstrate using real travel-time data that the pickup and delivery times calculated by the algorithm are reasonably accurate.

Description:

Twenty demands are input at various times. For each vehicle, the various link times are known from actual travel times measured on Cambridge streets, as given in the reference 1 below. Using this information, comparison between the real and calculated times can be made. Vehi commands are given according to actual driving times, plus 30 seconds for each pickup and 30 seconds for each delivery.

Expected Result:

Whether the algorithm calculates times that are close to those determined by actual driving will be determined as follows: The predicted pickup and delivery times will be determined from the print out time of CRS0000. These will be compared to the actual pickup and delivery times as determined from the time of entry of the corresponding vehi command. The differences will be tabulated and a histogram (10 second increments) drawn up. Conformance to the range stated in Reference 1 will be determined. The trend in time will be determined by grouping the data into 15 minute blocks and repeating the process on each block of data.

Reference 1 - Letter to Mr. Juan Bellantoni from Mr. E. M. Porter, Jr. dated July 23, 1971.

Initialization Procedure: Standard (Appendix D)

Computer Hardware Configuration: 360/67 (Appendix A)

Street Map File: Cambridge (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3

Output Types: Console

Display Equipment Required: No

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00 :00:00	local CARS
		CRS0105 VEH AT CARS
		loca2 CITY HALL
		CRS0105 VEH AT CITY HALL
PASS	00:00:00	arnie
		20 PUTNAM AV
		200 VASSAR ST
VEHI		CRS0105 V 0002 P ARNIE 20 PUTNAM AV
		CRS0000 ARNIE V 0002 B D
PASS	00:00:20	bob
		cars

Note: The exact time of entry of the vehi commands will be recorded as part of the test data. In this scenario vehi commands without input times are to be input immediately after the preceding input time.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		77 mass av
		CRS0000 BOB V0001 P D
VEHI		CRS0105 V 0001 P BOB CARS
PASS	00:00:40	dan
		77 mass av
		post office
		CRS0000 DAN V 001 P D
VEHI	00:00:50	vehi
		CRS0110 V 0001 D BOB 77 MASS AV
PASS	00:01:30	charlie
		100 plympton st
		705 memorial dr
		CRS0000 CHARLIE V 0002 P D
VEHI	00:02:00	vehi2
		CRS0105 V 0002 P CHARLIE 100 PLYMPTON
PASS	00:02:00	ed
		425 mass av
		550 green st
		CRS0000 ED V 0001 P D
VEHI	00:03:00	vehi1
		CRS0105 V 0001 P DAN 77 MASS AV

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
	00:03:10	vehi1
		CRS0105 V 0001 P ED 425 MASS AVE
PASS	00:03:30	george
		300 western av
		200 vassar st
		CRS0000 GEORGE V 0002 P D
VEHI	00:04:30	vehi2
		CRS0105 V 0002 P GEORGE 300 WESTERN
PASS	00:05:00	frank
		central sq.
		harvard sq.
		CRS0000 FRANK V 0001 P D
VEHI	00:06:10	vehi1
		CRS0105 V 0001 P FRANK CENTRAL SQ.
PASS	00:06:50	harry
		200 allston st
		77 mass av
		CRS000 HARRY V 002 P D
VEHI	00:09:00	vehi1
		CRS0105 V 0001 D DAN POST OFFICE
	00:10:00	vehi2

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
		CRS0105 V 0002 D CHARLIE 705 MEMORIAL DR.
	00:10:30	vehi1
		CRS0110 V 0001 D ED 550 GREEN ST
PASS	00:11:00	ingrid
		77 mass av
		CARS
		CRS0000 INGRID V0002 P D
	00:12:50	vehi1
		CRS0110 V0001 D FRANK HARVARD SQ
VEHI	00:13:00	vehi2
		CRS0110 V 0002 P HARRY 200 ALLSTON ST
PASS	00:14:00	judy
		harvard sq.
		1045 mass ave
		CRS0000 JUDY V 0001 P D
VEHI	00:16:00	vehi2
		CRS0110 V 0002 D ARNIE 200 VASSAR ST
PASS	00:17:00	kathy
		city hall
		20 lopez st
		CRS000 KATHY V 0001 P D

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:19:30	vehi2
		CRS0110 V 0002 D GEORGE 200 VASAR ST
		vehi2
		CRS0110 V 0002 D HARRY 77 MASS AV
	00:20:30	vehi1
		CRS0105 V 001 P JUDY HARVARD SQ.
		vehi1
		CRS0110 V 0001 D JUDY 1045 MASS AVE
VEHI	00:21:30	vehi2
		CRS0105 V 0002 P INGRID 77 MASS AVE
	00:22:00	vehi2
		CRS0110 V 0002 D INGRID CARS
PASS	00:22:00	olivia
		morse school
		77 mass av
		CRS0000 OLIVIA V 0001 P D
PASS	00:23:00	linda
		CARS
		JOYCE CHEN
		CRS0000 LINDA V 0002 P D
VEHI	00:24:30	vehi2

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	Input/OUTPUT
		CRS0110 V 0002 P LINDA CARS
		vehi2
		CRS0110 V 0002 D LINDA JOYCE CHEN
PASS	00:25:00	martha
		cars
		harvard sq
		CRS0000 MARTHA V 0002 P D
	00:26:30	nora
		705 memorial dr
		harvard sq
		CRS00000 NORA V 0002 P D
VEHI	00:27:00	vehi1
		CRS0105 V 0001 P KATHY CITY HALL
	00:27:40	vehi2
		CRS0105 V 0002 P MARTHA CARS
	00:31:10	vehi2
		CRS0110 V0002 P NORA 705 MEMORIAL DR
	00:34:00	vehi2
		CRS0110 V 0002 D MARTHA HARVARD SQ
PASS	00:34:00	paula
		77 mass av

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		city hall
		CRS0 PAULA V 0001 P D
VEHI	00:34:00	vehil
		CRS0110 V 0001 D KATHY 20 LOPEZ ST
	00:37:30	vehil
		CRS0105 V 0001 P OLIVIA MORSE SCHOOL
	00:39:00	vehil
		CRS0110 V 0001 D OLIVIA 77 MASS AVE
	00:44:50	vehil
		CRS0105 V 0001 P PAULA 77 MASS AVE
		vehil
		CRS0110 V 0001 D PAULA CITY HALL
PASS	00:45:00	quentin
		harvard sq
		central sq
		CRS0000 QUENTIN V 0002 P D
	00:45:30	rachel
		harvard sq
		mit
		CRS0000 RACHEL V 0002 P D
	00:46:30	susan
		mit

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		705 memorial dr
		CRS0000 SUSAN V 0002 P D
	00:47:00	tricia
		morse school
		cars
		CRS0000 TRICIA V 0001 P D
VEHI	00:47:30	vehi2
		CRS0110 V 0002 D NORA HARVARD SQ
		vehi2
		CRS0105 V 0002 P QUENTIN HARVARD SQ.
		vehi2
		CRS0105 V 002 P RACHEL HARVARD SQ.
		vehi2
		CRS0110 V 002 D QUENTIN CENTRAL SQ.
	00:50:00	vehi1
		CRS0105 V 0001 P TRICIA MORSE SCHOOL
	00:55:30	vehi1
		CRS0110 V 0001 D TRICIA CARS
	00:60:00	vehi1
		CRS0115 V 0001 NOW UNASSIGNED
	00:60:00	vehi2

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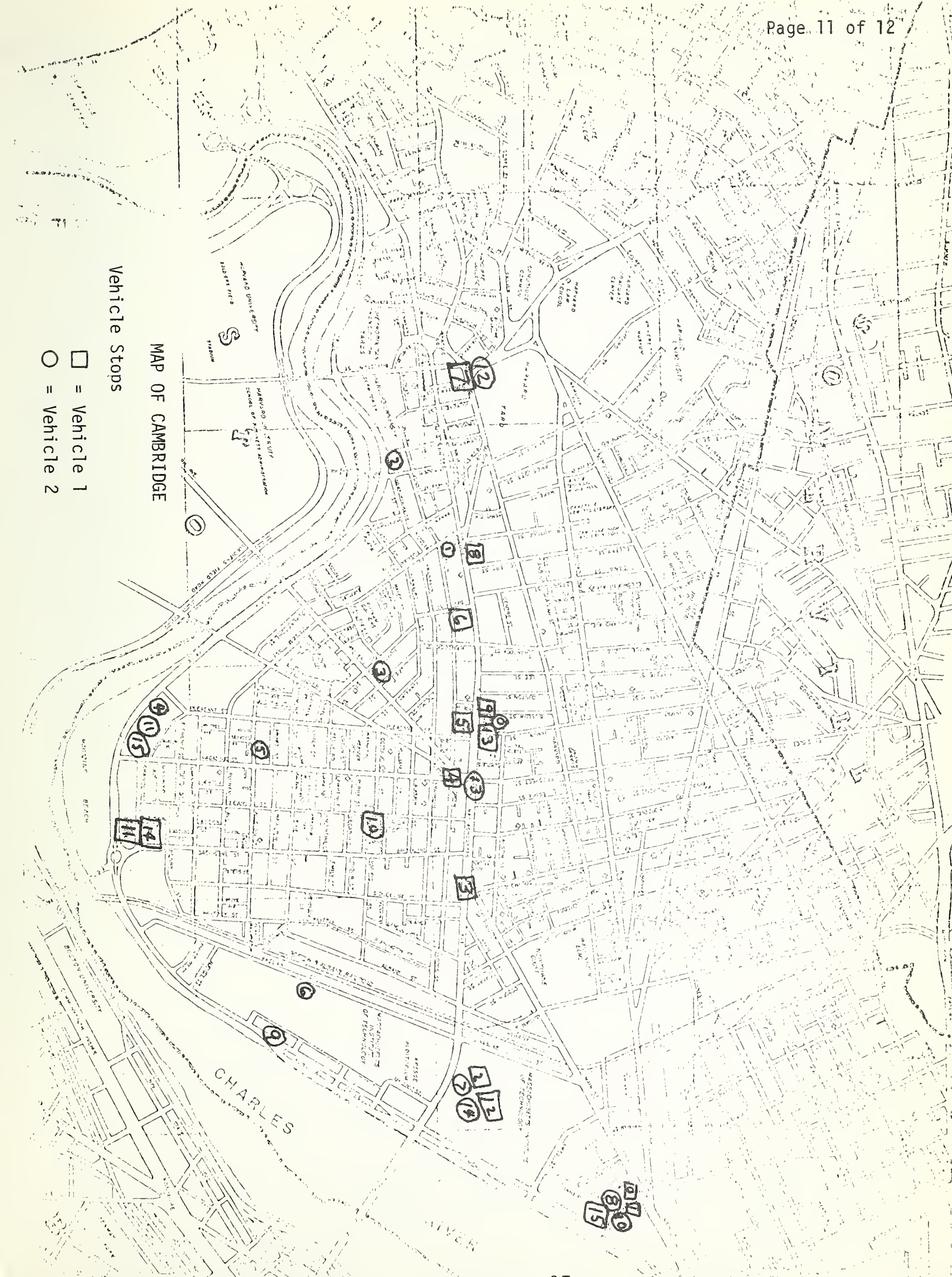
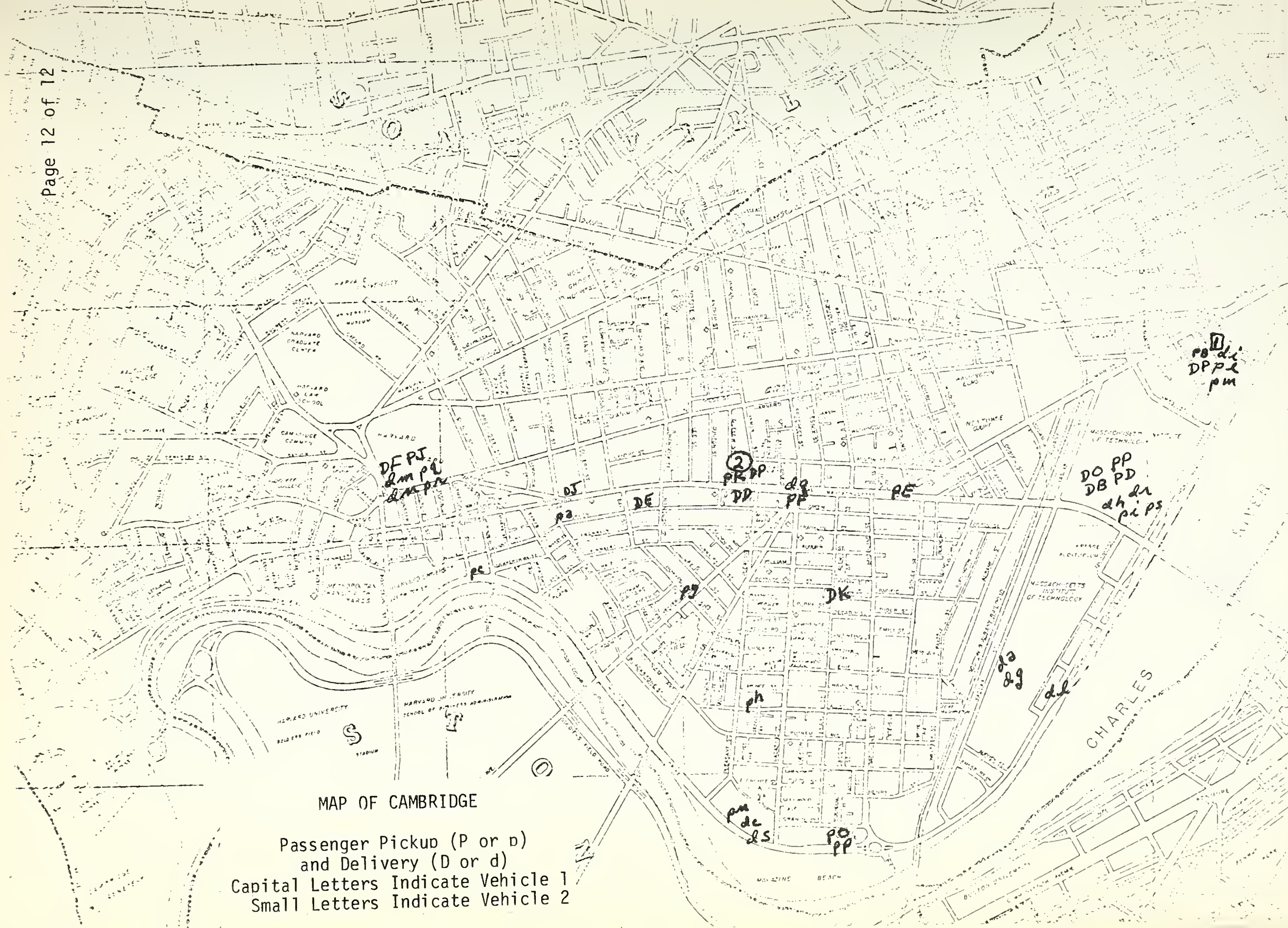
CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		CRS0105 V 0002 D RACHEL MIT
	00:64:00	vehi2
		CRS0105 V 0002 P SUSAN MIT
	00:64:00	vehi2
		CRS0110 V 0002 D SUSAN 705 MEMORIAL DR
	00:68:00	vehi2
		CRS0115 V 0002 NOW UNASSIGNED


Vehicle Stops
□ = Vehicle 1
○ = Vehicle 2
HARVARD UNIVERSITY SOLDIERS FIELD
STADIUM
HARVARD UNIVERSITY SCHOOL OF BUSINESS ADMINISTRATION
HARVARD YARD
HARVARD LAW SCHOOL
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
BOSTON UNIVERSITY
CHARLES
RIVER

MAP OF CAMBRIDGE



MAP OF CAMBRIDGE

Passenger Pickup (P or p)
and Delivery (D or d)
Capital Letters Indicate Vehicle 1
Small Letters Indicate Vehicle 2

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Delivery and Pick-up Constraints (Violation)   Number: I.2.3.b

Date of Approval: 2 June 71   Page 1 of 5

Work Statement References: 3.6.3.3 (page 25)   Running Time .30

Test Conditions: ____ OM   ____ MO   X MM   ____ MS   ____ SM

Number of Vehicles 2   Vehicle Capacity 8

Mean Vehicle Speed 12 (mph)   Number of Riders 2

Constraints: Waiting Time = 4 (min.)

Travel Time = 1.5 D + 3 (min.)

Total Time = 1.5 D + 7 (min.)

Purpose:

To demonstrate that the program will make assignments without violating the inputted waiting and travel time constraints, given enough vehicles.

Description:

The two vehicles are located as in the diagram, arnie's request (a) is entered and assignment to vehicle 1 occurs. Then bob's request is entered and assigned. The test is performed for three different locations (a), (b) and (c) of bob's request and for a more remote location (d) of vehicle 1.

Expected Result:

The vehicle speed is 2 boxes per minute and 30 seconds is allowed for pickup and for delivery. Therefore, vehicle 1 can detour to service bob in case (a) but not in case (c) for which the 4 minute waiting time constraint is violated; vehicle 2 must service bob. Case (b) is marginal but should require use of vehicle 2 when boarding time is considered. Finally, vehicle 1 cannot service bob in case (d) because of the waiting time constraint.

Page 2 of 5

References: FT02 File No.: 8

Initialization Procedure:

Computer Hardware Configuration: Appendix A

Street Map File: Grid

Non-Standard Inputs Required: None

Personnel Required: Standard

Output Types: Console Printouts

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
a) VEHI	00:00:00	local 10 30 st
		CRS0150 VEH AT ADDRESS
		loca2 40 30 st
	00:00:10	CRS0150 VEH AT ADDRESS
PASS		arnie
		10 60 st
		90 60 st
VEHI	00:00:20	CRS0105 V 1 P ARNIE 10 50 ST
PASS	00:00:20	CRS0000 ARNIE V 1 P 1 D 5
		bob
		40 80 st
		60 80 st
	00:00:30	CRS0000 BOB V 1 P 3 D 4

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:01:00	vehil
	00:01:00	CRS0105 V 1 P BOB 40 80 ST
	00:03:00	vehil
	00:03:00	CRS0110 V 1 D BOB 60 80 ST
	00:04:00	vehil
	00:04:00	CRS0110 VEH 1 D ARNIE 90 50 ST
	00:06:00	vehil
	00:06:00	CRS0115 V 1 NOW UNASSIGNED
(b) and (c)	The sequence for (a) is repeated up to the request for	
	bob, which is entered as	
PASS		bob
		40 90 st
		60 90 st
	in case	(b), and as
		bob
		40 100 st
		60 100 st
	in case	(c). Then vehicle 2 is assigned to pick up bob.
(d) The first entry of case (a) is changed to		
VEHI 1	00:00:00	local 10 0 st

and then the scenario proceeds as in case (a) down to the bottom of page 2, at which point vehicle 2 will be assigned to pick up bob.

Date Test Run: ________________

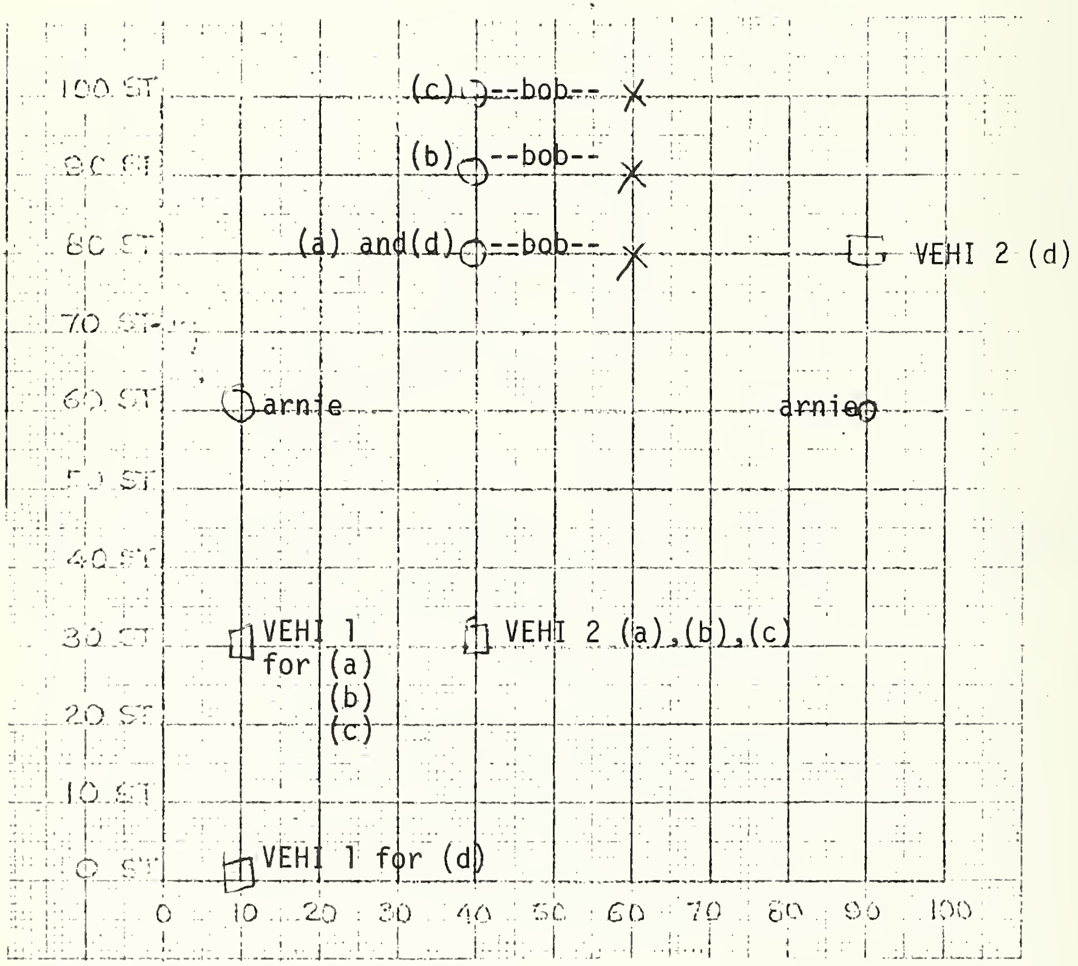
Time Test Started: ________________

Time Test Ended: ________________

Data Taken by: ____________________________________

T. Higonnet's posture: ________seated ________standing ________prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Realistic Case (Cambridge) Number: I.2.6

Date of Approval: 2 June 71 Page 1 of 11

Work Statement References: Pages 21, 22, & 23 Running Time 60

Test Conditions: X OM X MO X MM ___ MS ___ SM

Number of Vehicles 6 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders about 60

Constraints: Waiting Time = 15(10)(min.) priority 1

Travel Time = 1.5(1.3)D + 5(3) (min.) (priority 2)

Total Time = 1.5(1.3)+ 5(3) (min.)

Purpose:

To verify proper operation of graphics, restart, cancellation of requests, unexpected situations, vehicle breakdown, lateness detection, priority classes, standing requests, automatic billing, hard copy for manual backup, as well as general program operation, in a situation such as might occur between 8:00 a.m. and 9:00 a.m. in Cambridge, Mass.

Description:

About 15 standing requests are entered for approximately 8:05 - 8:15 a.m. pickup with destination at Harvard Sq. Another 10 standing requests are entered for approximately 8:25 - 8:35 pickup with destination at Harvard Sq. Another group of 10 are entered for pickup between 8:00 - 8:30 with destination at Morse School. About 28 other requests will be entered during this hour with varied trips. A vehicle traveling to Morse School breaks down at 8:20; the computer breaks down at 8:25 and is restarted at 8:35. Graphic outputs are recorded at 8:10, 8:20, 8:30, 8:40, and 8:50. A high priority request is entered at 8:28. Two of the 8:15 standing requests fail to show. More than the expected number for one demand show up to go to Morse School.

Expected Result:

Cancellation of two standing requests will be reflected on the automatic billing cards; the standing requests will be serviced in an efficient manner. The graphic outputs will correspond to the terminal sheets and indicate system status. The anomaly to Morse school will be serviced; the system will recover and the manual data will be incorporated to it. Mr. Bang will receive rapid assignment and the O-M tours laid out efficiently. The demands for the broken down vehicle will be reassigned efficiently.

---

[1] A description of the priority class constraints is provided in a letter dated 22 July 1971 - E. H. Porter, Jr./MIT to J. Bellantoni/TSC.

References: FT02 File No.: 6 (Appendix B)

Initialization Procedure: Standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Cambridge (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 4

Output Types: terminal sheets, line printer, billing cards

Display Equipment Required: ARDS

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR 1 BACKUP ~~SUPERVISOR~~

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
NOTE:	35 standing requests will have been entered prior to start of	
	test and are not shown here (see attachment 1)	
NOTE:	No dispatch messages are shown	
PASS	8:01:00	acct 1020365 prir 2 ralph nader
		~~harvard sq~~
		~~city hall~~
PASS	8:01:30	acct 1234567 mr. phoney MIT city hall
PASS	8:02:00	acct 1020365 0003 raiders
		harvard sq
		city hall
PASS	8:03:00 8:03:30	cncl sra 1 cncl sra 6

NOTE: Continuous output will appear on the Backup terminal. The output messages are not listed in what follows.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
PASS	8:04:00	nurse duckett
		27 cross st
		10 grant st
PASS	8:05:00	major major
		280 franklin st
		morse school
NOTE:	The following request is automatically billed	
PASS	8:10:00	acct 1000124 roger williams
		20 ames st
		morse school
ARDS	8:10:00	ERAS VEHI ALL*
		ERAS ASSN major major
		HIST 6 PASP sra10*
*NOTE:	The ARDS screen is now recorded	
PASS	8:15:00	herman
		60 wadsworth st
		morse school
VEHI	8:15:30	anom x 3
	8:15:40	3 AT NEXT STOP FOR x
VEHI	8:16:00	vehix
VEHI	8:20:00	breax

vehicle x is assigned to herman

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	8:20:10	ENTER LOCATION OF BREAKDOWN
	8:20:30	10 perry st
	8:20:50	VEH yy P name address
	etc.	etc.
	8:21:00	nn DEMANDS REASSIGNED FOR VEHICLE 0002
ARDS	8:23:00	ERAS HIST XX
		ERAS VEHI XX
		VEHI 6 *
		ERAS VEHI ALL *
* NOTE:	The ARDS screen is now recorded.	
PASS	8:24:00	prir 2 mr. bang
		10 erie st
		kendall sq
OPER	8:25:00	The operator now crashes the system. The manual
		backup system is employed until restart occurs.
MANUAL	8:28:00	joe
		10 perry st
		kendall sq
MANUAL	8:30:00	pattie
		harvard sq
		lafayette sq.

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
MANUAL	8:31:00	laverne
		100 mass av
		11 dunster st
NOTE:	8:35:00	The system is restarted and a status dump taken.
PASS	8:35:10	romona
		100 memorial dr
		ymca
	8:35:20	acct 1020036 mrs uhaul
		4 grant st
		post office
VEHI	8:37:00	vehi xx
NOTE:	The number xx corresponds to the vehicle that was assigned.	
	to pick up laverne.	
PASS	8:40:30	yossarian
		police dept
		2 erie st
VEHI	8:37:30	anom xx 5
ARDS	8:40:00	VEHI 6 *
		ERAS
		VEHI ALL *
* NOTE:	The ARDS screen is now recorded.	

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
PASS	8:45:00	maid 1
		harvard sq
		60 wadsworth st
		maid 2
		harvard sq
		10 front st
		acct 1020141 maid 3
		harvard sq
		7 lansdowne st
		maid 4
		harvard sq
		12 cottage st
		maid 5
		harvard sq
		1 hayward st
		maid 6
		harvard sq
		sub shop
		maid 7
		harvard sq
		57 allston st

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		maid 8
		harvard sq
		10 decatur st
		maid 9
		harvard sq
		72 pleasant st
		maid 10
		harvard sq
		312 pearl st
		maid 11
		harvard sq
		222 river st
		acct 1020253 maid 12
		harvard sq
		11 valentine st
		maid 13
		harvard sq
		kendall sq'
ARDS	8:50:00	W8TD 2
		ERAS
		WAIT 5 *

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
*NOTE	The ARDS display screen is now recorded.	
PASS	8:50:00	mr iriquois
		harvard sq
		3 kinnaird st
		mr soux
		harvard sq
		10 green st
ARDS	8:51:00	ERAS
		STAT *
		ERAS
		VEHI ALL *
* record ARDS display screen		

Date Test Run: ____________

Date Test Started: ____________ Time Test Ended: ____________

Date Test Ended: ____________

To Diagram the posture: _____seated _____standing_____ prone

Diagrams:

Notes:

1. No automatic billing except where specified.
2. Standing request list on attachment 1.
3. Times shown may be incremented or decremented by integral hours to make them correspond to the actual time at which the test is contacted.

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

Attachment 1 to Scenario I.2.6-2

Standing requests, entered into FT02F001 file before test:

PASS NAME	ORIGIN	DESTINATION	PICKUP TIME
SRA 1	1 FRONT ST	HARVARD SQ.	8:08
SRA 2	15 AMES ST	HARVARD SQ.	8:08
SRA 3	10 ALBANY ST	HARVARD SQ.	8:08
SRA 4	64 STATE ST	HARVARD SQ.	8:08
SRA 5	30 GRANITE ST	HARVARD SQ.	8:08
SRA 6	29 CROSS ST	HARVARD SQ.	8:08
SRA 7	1 FRANKLIN ST	HARVARD SQ.	8:10
SRA 8	1 CENTRAL SQ	HARVARD SQ.	8:10
SRA 9	30 RIVER ST	HARVARD SQ.	8:10
SRA 10	700 MEMORIAL DR	HARVARD SQ.	8:10
SRA 11	11 PUTNAM AV	HARVARD SQ.	8:15
SRA 12	70 PUTNAM AV	HARVARD SQ.	8:15
SRA 13	50 RIVER ST	HARVARD SQ.	8:15
SRA 14	4 GRANT ST	HARVARD SQ.	8:15
SRA 15	370 GREEN ST	HARVARD SQ.	8:15
SR 1	10 SMART ST	HARVARD SQ.	8:25
SR 2	20 AUDREY ST	HARVARD SQ.	8:25
SR 3	MIT	HARVARD SQ.	8:25
SR 4	35 SIDNEY ST	HARVARD SQ.	8:30
SR 5	100 AUBURN ST	HARVARD SQ.	8:30
SR 6	79 FRANKLIN ST	HARVARD SQ.	8:30
SR 7	58 ALLSTON ST	HARVARD SQ.	8:30
SR 8	100 MEMORIAL DR	HARVARD SQ.	8:35
SR 9	600 MEMORIAL DR	HARVARD SQ.	8:35
SR 10	9 KINNAIRD ST	HARVARD SQ.	8:35
SMA 1	MIT	MORSE SCHOOL	8:05
SMA 2	HARVARD SQ	MORSE SCHOOL	8:05
SMA 3	5 WADSWORTH ST	MORSE SCHOOL	8:05
SMA 4	2 FRONT ST	MORSE SCHOOL	8:10
SMA 5	700 GREEN ST	MORSE SCHOOL	8:10
SMA 6	10 COWPERTHWAITE ST	MORSE SCHOOL	8:15
SMA 7	100 AUBURN ST	MORSE SCHOOL	8:15
SMA 8	10 COTTAGE ST	MORSE SCHOOL	8:20
SMA 9	CENTRAL SQ	MORSE SCHOOL	8:25
SMA 10	50 LOPEZ ST	MORSE SCHOOL	8:30

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Restart Number: I.3.1.A & B

Date of Approval: 21 June 71 Page 1 of 1

Work Statement References: 3.4.1 (page 21) Running Time ___

Test Conditions: X OM X MO X MM ___ MS ___ SM

Number of Vehicles 6 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders About 60

Constraints: Waiting Time = ___ (min.)

Travel Time = ___ D + ___ (min.)

Total Time = ___ D + ___ (min.)

Purpose:

To verify that the ODAR program restart capability will properly function.

Description:

During the execution of the Realistic Case (Cambridge) Scenario (I.2.6), the computer system will be shut down and then started up again to simulate a computer system malfunction.

Expected Result:

The restart capability will enable the computer system to come back into operation and satisfactorily schedule vehicles.

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: CANCELLATION OF SERVICE REQUESTS Number: I.3.2

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: ______ Running Time 6 min

Test Conditions: ___ OM ___ MO X MM ___ MS ___ SM

Number of Vehicles 20 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders 2

Constraints: Waiting Time = 30 (min.)

Travel Time = 1.5 D + 10 (min.)

Total Time = 1.5 D + 40 (min.)

Purpose:

1) determine effect of cancellation when reassignment due to breakdown occurs

Description:

Assign two demands to the same vehicle, pick-up the first demand a little later, wait several minutes, and break the vehicle down. Immediately cancel both requests.

Expected Result:

The breakdown and cancellations will be handled successfully.

Page 2 of 5

References: FT02 File No.: 3

Initialization Procedure: standard

Computer Hardware Configuration: Appendix A

Street Map File: CAMBRIDGE

Non-Standard Inputs Required: NONE

Personnel Required: standard

Output Types: CONSOLE

Display Equipment Required: NONE

Consoles Required: 1 VEHICLE 1 PASSENGER ___ OPERATOR 1 SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
PASS	00:00:00	first
		kendall sq
		harvard sq
VEHI	00:00:10	CRS0105 VEH 14 FIRST KENDALL SQ
PASS	00:00:10	CRS0000 FIRST V 14 P1 D15
	00:00:20	second
		faculty club
		14 plympton st
	00:00:30	CRS0000 SECOND V 14 P2 D16
VEHI	00:01:30	vehi14
	00:01:40	CRS0110 VEH 14 P SECOND FACULTY CLUB

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:03:40	brea14
	00:03:50	CRS0130 ENTER LOCATION OF BREAK-DOWN
	00:04:00	faculty club
	00:04:10	CRS0105 VEH 3 P FIRST FACULTY CLUB
	00:04:10	CRS0134 0002 DEMANDS REASSIGNED FOR VEHICLE 14
PASS	00:05:10	cncl first
	00:05:20	CR0275 FIRST TIME 0 V 0003 FACULTY CLUB
	00:05:30	yes
	00:05:40	CRS0300 FIRST CANCELLED
VEHI		CRS0280 NEXT STOP FOR VEHICLE 3 CANCELLED
		CRS105 VEH 3 P SECOND FACULTY CLUB

Date Test Run: ____________

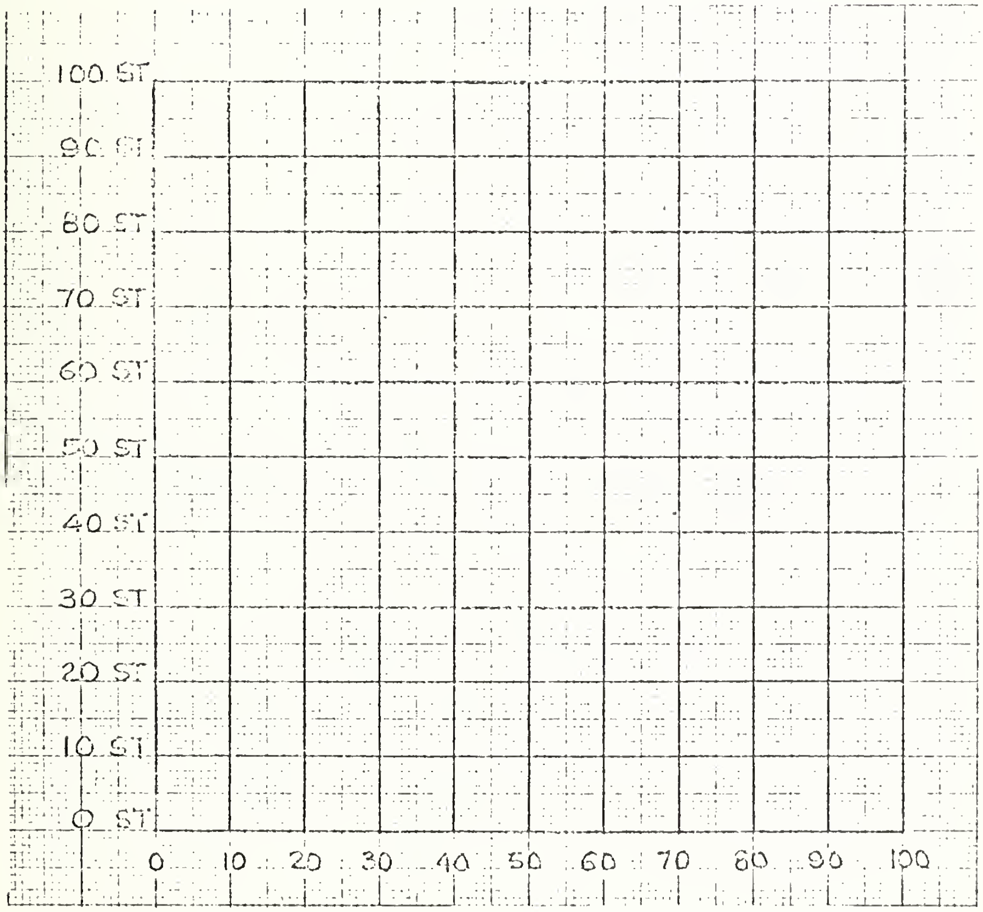
Time Test Started: ____________

Time Test Ended: ____________

Data Taken by: ______________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Page 5 of 5

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Unexpected Situations Number: I.3.3

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.4.1 (page 22) Running Time 15

Test Conditions: ___ OM ___ MO x MM ___ MS ___ SM

Number of Vehicles 20 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders 9

Constraints: Waiting Time = 30 (min.)

Travel Time = 1.5 D + 10 (min.)

Total Time = 1.5 D + 40 (min.)

Purpose:

To test that ODAR will handle the situation where the number of passengers appearing at a stop is other than that requested and that ODAR will manage the case where the passenger either does not show up for his pick-up as he requests an immediate delivery while in the vehicle as opposed to proceeding to his destination.

Description:

Assign two demands (one 5 pax., one 3 pax.); indicate that only 2 have showed up for first pickup stop and observe results. Now assign a third demand; wait a short period of time and indicate that he has not showed up at the pick-up stop. Lastly, handle an immediate delivery request for the three passenger demands.

Expected Result:

The algorithm will successfully alter the number of passengers from 5 to 3 for the first demand. Secondly, a no-show situation will be handled successfully as will an immediate delivery.

Page 2 of 5

[illegible]: FT02 File No.: #3 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: CAMBRIDGE (Appendix C)

Non-Standard Inputs Required: NONE

Personnel Required: 3 Standard People

Output Type: CONSOLE

Display Equipment Required: NONE

Consoles Required: X VEHICLE X PASSENGER X OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
PASS	00 : 00: 00	5 first
		kendall sq
		harvard sq
VEHI	00:00:10	CRS0105 V 14 P 5 FIRST KENDALL SQ
PASS	00:00:10	CRS0000 5 FIRST V 14 P 1 D 15
	00:00:20	3 second
		kendall sq
		harvard sq.
	00:00:30	CRS0000 3 SECOND V 14 P 1 D 15
VEHI	00:01:00	vehi14
	00:01:10	CRS0105 VEH14 P 3 SECOND KENDALL SQ

Page 3 of 5

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:01:20	anom14 2
		CRS0255 2 AT NEXT STOP FOR 14
		vehi14
		CRS110 VEH14 D 5 FIRST HARVARD SQ
PASS	00:05:00	third
		morse school
		city hall
VEHI	00:05:10	CRS0105 V 7 P THIRD MORSE SCHOOL
PASS	00:05:10	CRS0000 THIRD VEH7 P 1 D 9
VEHI	00:06:00	anom14 0
	00:06:10	CRS0260 ERROR - NOT A PICK-UP STOP - MONITOR SWITCHES SET
	00:06:20	CRS0260 anom07 0
	00:06:30	CRS0250 IS THIS A NO-SHOW FOR 07 (ANSWER YES FOR NO-SHOW)
	00:06:40	yes
	00:06:50	CRS0115 VEH7 NOW UNASSIGNED
	00:06:50	CRS0115 0 AT NEXT STOP FOR 07
	00:10:00	cnclsecond
	00:10:10	CRS0275 SECOND TIME 0 V 14 KENDALL SQ
	00:10:20	CRS0285 ON VEHICLE - GIVE VEHICLE LOCATION
	00:10:30	800 memorial dr
	00:10:40	VEH 14 AT 800 MEMORIAL DRIVE
	00:10:40	SECOND CANCELLED

Page 4 of 5

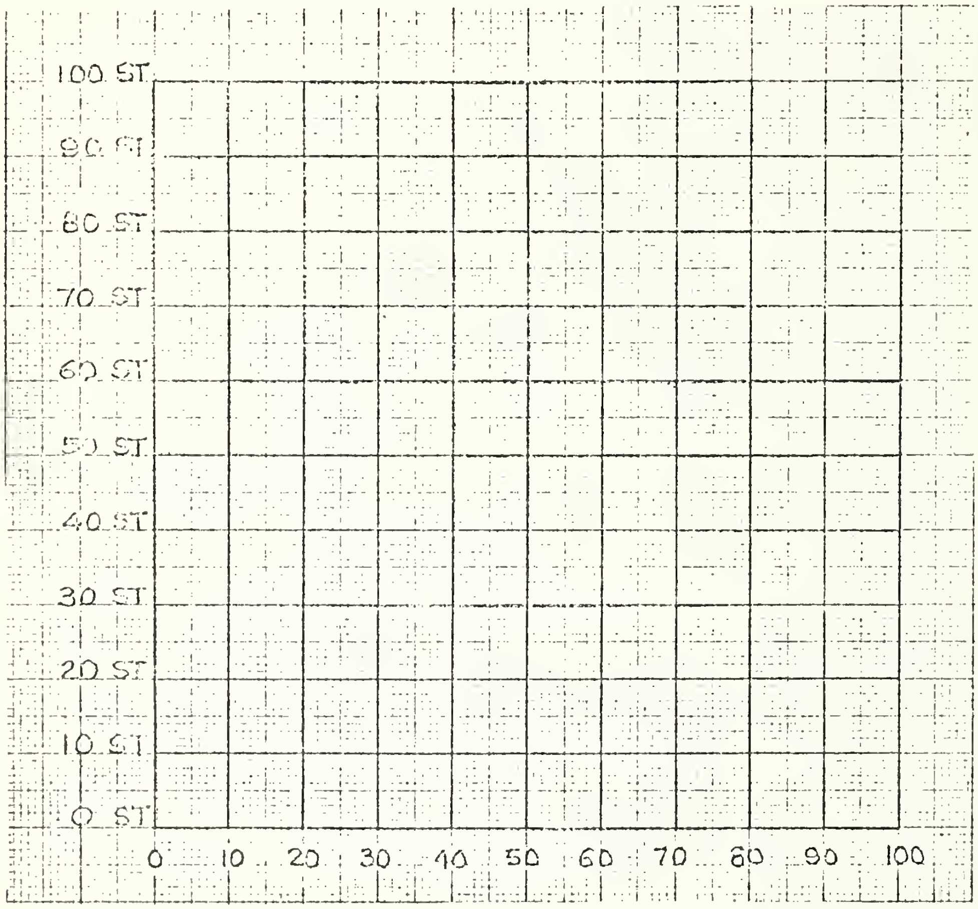
Date Test Run: ____________

Time Test Started: ____________ Time Test Ended: ____________

Data Taken by: ____________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Page 5 of 5

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: VEHICLE BREAKDOWN PROCEDURE Number: I.3.4

Date of Approval: 2 June 71 Page 1 of 6

Work Statement References: 3.4.1 (page 22) Running Time .15

Test Conditions: ___ OM ___ MO X MM ___ MS ___ SM

Number of Vehicles 20 Vehicle Capacity 8

Mean Vehicle Speed 15 (mph) Number of Riders 3

Constraints: Waiting Time = 10 (min.)

Travel Time = 1.5 D + 30 (min.)

Total Time = 1.5 D + 40 (min.)

Purpose:

Test vehicle breakdown and the resulting waiting times against those of similarly located new demands.

Description:

Two demands will be assigned to different vehicles; the first demand will be picked up and then both vehicles will be broken down in succession. The system will then be brought back to the state prior to test; however, the two vehicles will remain broken down. Again, the two demands will be entered and the assignments observed. This time, however, the first demand will have its origin at the previous break-down point.

Expected Result:

The breakdown of two vehicles and subsequent reassignments will be handled successfully.

Reference: FT02 File No.: #3 (Appendix B) Page 2 of 6

Initialization Procedure: (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: CAMBRIDGE (Appendix C)

Non-Standard Inputs Required: NONE

Personnel Required: 3

Output Types: CONSOLE

Display Equipment Required: NONE

Consoles Required: X VEHICLE X PASSENGER X OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	INPUT/OUTPUT
PASS	00:00:00	first
		kendall sq
		harvard sq
VEHI	00:00:10	CRS0105 VEH 14 P FIRST KENDALL SQ
PASS	00:00:10	CRS0000 FIRST V 14 P 1 D 15
PASS	00:00:20	second
		morse school
		city hall
	00:00:30	CRS0000 SECOND V 7 P 1 D 9
VEHI	00:02:30	VEHI14 CRS0110 VEH 14 D FIRST HARVARD SQ
	00:06:00	brea14

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:06:10	CRS0130 ENTER LOCATION OF BREAK-DOWN
	00:06:20	sub shop
	00:06:30	CRS0105 VEH 0016 P FIRST SUB SHOP
	00:06:30	CRS0134 0001 DEMANDS REASSIGNED FOR VEHICLE 0014
	00:06:40	brea7
	00:06:50	CRS0170 VEH 0007 5 MINS LATE AT MORSE SCHOOL
	00:07:00	CRS0130 ENTER LOCATION OF BREAK-DOWN
	00:07:10	45 green st
	00:07:20	CRS0105 VEH 0018 P SECOND MORSE SCHOOL
	00:07:20	CRS0134 0001 DEMANDS REASSIGNED FOR VEHICLE 0007
PASS	00:07:30	third
		45 green st
		harvard sq
	00:07:40	CRS0000 THIRD V 16 P 1 D 11
VEHI	00:07:40	VEHI 16 CRS0105 VEH 16 P THIRD 45 GREEN ST
	00:08:00	vehi16
	00:08:10	CRS0110 VEH 0016 D FIRST HARVARD SQ
	00:11:00	vehi16
		VEHI 16 D THIRD HARVARD SQ
		VEHI16
	00:11:10	CRS0115 VEH 0016 DISPATCHED TO STATION 2
	00:11:20	vehi18

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:11:20	CRS0110 VEH 18 D SECOND CITY HALL
	00:19:00	vehi18
	00:19:10	CRS0115 VEH 0018 DISPATCHED TO STATION 2
	00:19:20	local6 front st
	00:19:30	CRS0150 VEH AT FRONT ST
	00:19:40	local8 12 peters st
	00:19:50	CRS0150 VEH AT 12 PETERS ST
PASS	00:20:00	first
		sub shop
		harvard sq
	00:20:10	CRS0000 FIRST V 0016 P 001 D 0012
VEHI	00:20:10	CRS0105 VEH 14 P FIRST SUB SHOP
PASS	00:20:20	second
		morse school
		city hall
	00:20:30	CRS0000 SECOND V 0018 P0002 D0010
VEHI	00:20:40	CRS0105 VEH 18 P SECOND MORSE SCHOOL

Date Test Run: ____________

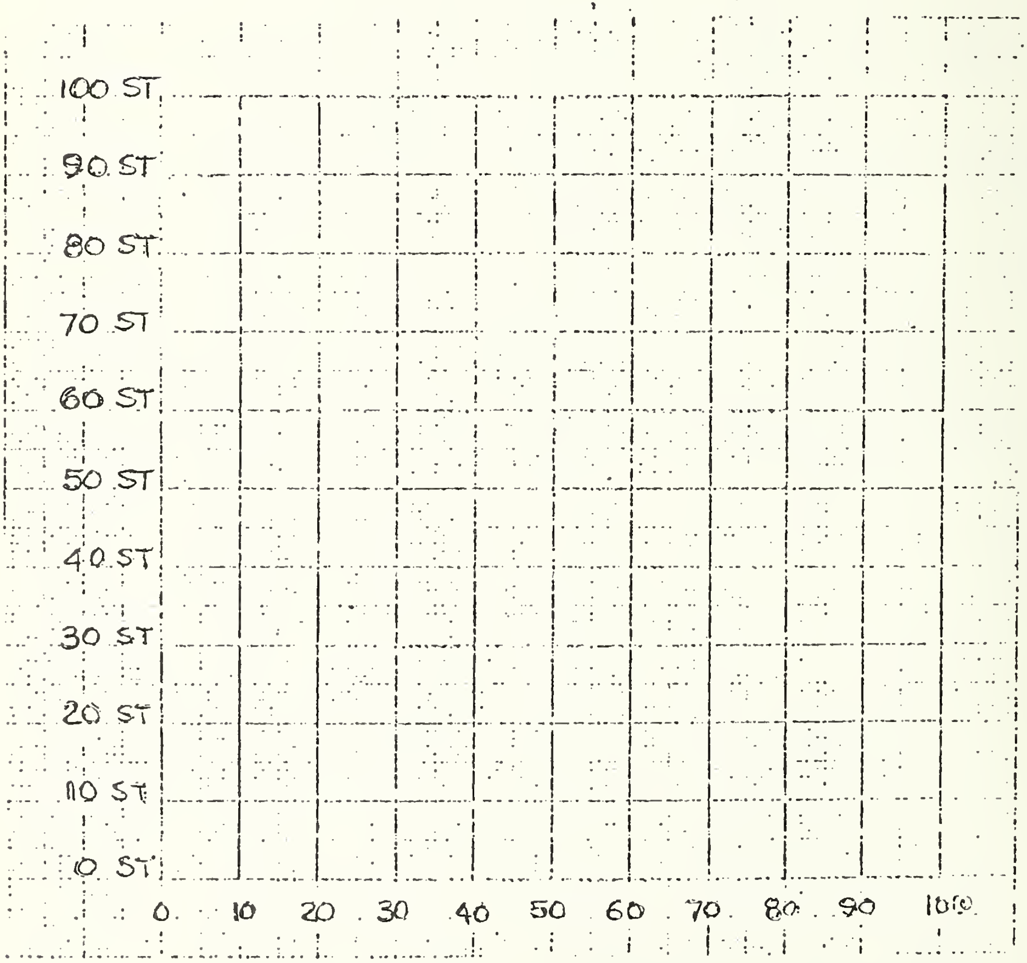
Time Test Started: ____________

Time Test Ended: ____________

Data Taken by: ______________________

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Lateness Detection and Correction Number: I.3.5

Date of Approval: 2 June 71 Page 1 of 5

Work Statement References: 3.4.1 (page 22) Running Time 10

Test Conditions: ___OM ___MO _X_MM ___MS ___SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 2

Constraints: Waiting Time = 3 (min.)

Travel Time = 1 D + 3 (min.)

Total Time = 1 D + 6 (min.)

Purpose:

To ascertain that the program will detect when a vehicle is excessively late & refrains from making further assignments to such a vehicle.

Description:

(a) Two vehicles are located as shown in the diagram. At time 00:00:00 arnie's request is received and assigned to vehicle 1; 30 seconds later bob's is received and assigned to vehicle 1 on the PASS terminal. Vehicle 1 checks in to 0 40 st at time 00:01:00 and is dispatched to service bob.

(b) Test (a) will be repeated, however, bob will be entered at 00:02:30 before any pick-ups are made.

(c) Test (a) will be repeated; bob will be entered at 00:03:30.

(d) Test (a) is repeated but no pick-ups are made.

Expected Result:

(a) Vehicle 2 will remain inactive
(b) Vehicle 2 will remain inactive
(c) Bob's request will be assigned to Vehicle 2.
(d) ODAR will detect late vehicles

Note 1: Bob will not be re-assigned in case (a)

Note 2: Further information regarding reassignment is contained in documents transmitted to Mr. J. Bellontoni from Mr. E. H. Porter, Jr. by letter dated 22 July 1971.

References: FT02 File No.: #4 (Appendix B)

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: Grid (Appendix C)

Non-Standard Inputs Required: None

Personnel Required: 3 Standard

Output Types: Console typeout

Display Equipment Required: None

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
(a) VEHI 1	: :	local 0 60 st
		loca2 20 0 st
PASS 1	00:00:00	arnie
		0 40 st
		60 40 st
VEH I 1	00:00:10	XXXXXX VEH 1 P ARNIE 0 40 st
PASS 1	00:00:10	XXXXXX ARNIE V 1 P 1 D 4
	00:00:30	bob
		20 40 st
		40 40 st
	00:00:35	XXXXXX BOB V 1 P 1 D 2

Page 3 of 5

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI1	00:01:00	vehil
		XXXXXX VEH 1 P BOB 20 40 ST
	00:02:00	vehil
		XXXXXX VEH 1 D BOB 40 40 ST
	00:03:00	vehil
	00:04:00	XXXXXX VEH 1 D ARNIE 60 40 ST
	00:04:00	vehil
		XXXXXX VEH 1 NOW UNASSIGNED

(b) through (c) Test (a) is repeated but bob is entered at times 00:02:30 and 00:03:30. No vehi commands are given prior to assignment of bob.

(d) Test (a) is repeated, but no vehil entries are made at all. The subsequent dispatching is observed. EOB should be hit at various points such that message may be written at console.

Date Test Run: ______________

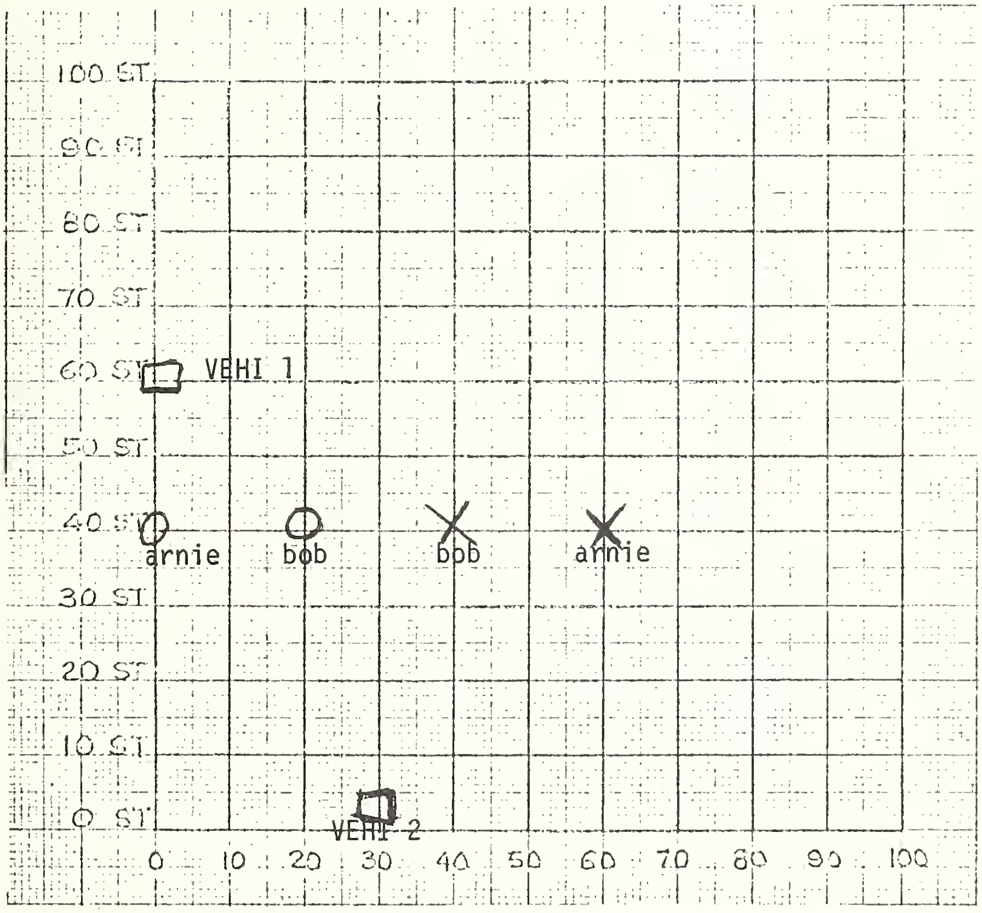
Time Test Started: ______________

Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet"s posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Priority Classes Number: I.3.6

Date of Approval: 2 June 71 Page 1 of 6

Work Statement References: 3.4.1 (page 22) Running Time ___

Test Conditions: ___ OM ___ MO X MM ___ MS ___ SM

Number of Vehicles 2 Vehicle Capacity 8

Mean Vehicle Speed 12 (mph) Number of Riders 2

Constraints: Waiting Time = 6 (min.)

Travel Time = 1.5 D + 2 (min.) 1D + 1

Total Time = 1.5 D + 8 (min.) 1D + 3

Purpose:

Measure difference in service rendered to different priority classes with different constraints.

Description:

Two situations are examined. In the first case, both demands are of priority class one. In the second case, one demand (ARNIE) is of priority class 2 and thus has tighter constraints. Two stops for Bob have 30 second times.

Expected Result:

In the first test, vehicle one will be chosen to service both demands. In the second test, vehicle 1 will service only ARNIE due to the tightness of his constraint and allowing for the pickup and delivery stop times for Bob. Here, BOB will be serviced by vehicle 2.

Reference #: FT02 File No.: #5 (Appendix B) Page 2 of 6

Initialization Procedure: standard (Appendix D)

Computer Hardware Configuration: Appendix A

Street Map File: GRID (Appendix C)

Non-Standard Inputs Required: TWO PRIORITY CLASSES

Personnel Required: 3 standard

Output Types: CONSOLE

Display Equipment Required: NONE

Consoles Required: 1 VEHICLE 1 PASSENGER 1 OPERATOR ___ SUPERVISOR

CHRONOLOGICAL LIST OF
INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
a) VEHI	00 :00:00	local 10 30 st
	00:00:10	CPS0150 VEH AT ADDRESS
	00:00:20	loca2 70 10 st
	00:00:30	CRS0150 VEH AT ADDRESS
PASS	00:00:40	arnie
		10 50 st
		90 50 st
VEHI	00:00:50	CRS0105 V 1 P ARNIE 10 50 ST
PASS	00:00:50	CRS0000 ARNIE V1 P2 D6
	00:01:00	bob
		40 70 st

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
		60 70 st
PASS	00:01:10	CRS0000 BOB V1 P4 D5
VEHI	00:01:40	vehil
	00:01:50	CRS0105 V 1 P BOB 40 70 ST
	00:04:00	vehil
	00:04:10	CRS0110 V 1 D BOB 60 70 ST
	00:05:10	vehil
	00:05:20	CRS0110 V 1 D ARNIE 90 50 ST
	00:08:00	vehil
	00:18:10	CRS0115 V 1 NOW UNASSIGNED :

b) The sequence for (a) is repeated up to the request for arnie, which is entered as

PASS	00:00:40	prir2 arnie
		10 50 st
		90 50 st
VEHI	00:00:50	CRS0105 V 1 P ARNIE 10 50 ST
PASS	00:00:50	CRS0000 ARNIE V1 P1 D5
	00:01:00	bob
		40 70 st
		60 70 st

Page 4 of 6

CHRONOLOGICAL LIST OF INPUTS AND OUTPUTS

Device Type and Number	Hours: Minutes: Seconds: from Start	input/OUTPUT
VEHI	00:01:10	CRS0105 V 2 P BOB 40 70 ST
PASS	00:01:10	CRS0000 BOB V2 P5 D6
VEHI	00:01:40	vehi1
	00:01:50	CRS0110 V 1 D ARNIE 90 50 ST
	00:05:10	vehi2
	00:05:20	CRS0110 V 2 D BOB 60 70 ST
	00:05:50	vehi1
	00:06:00	CRS0115 V 1 NOW UNASSIGNED
	00:06:10	vehi2
	00:06:20	CRS0115 V 2 NOW UNASSIGNED

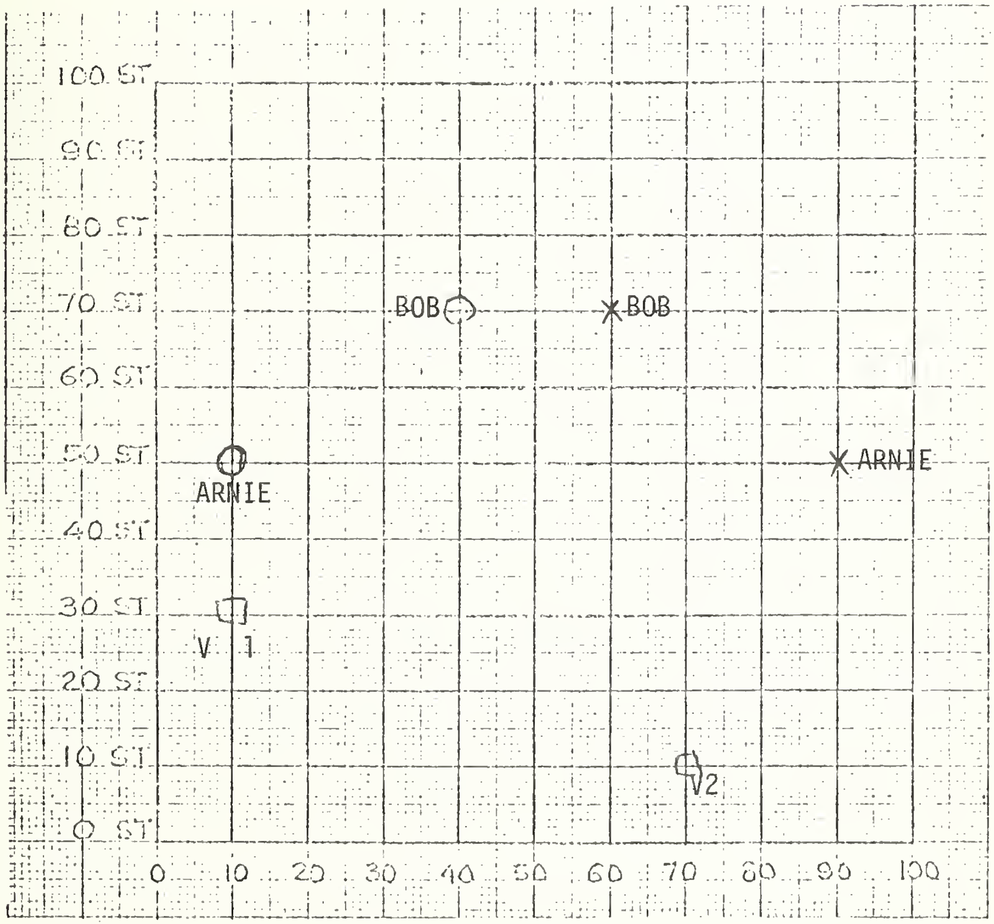
Date Test Run: ______________

Time Test Started: ______________ Time Test Ended: ______________

Data Taken by: ______________________________

T. Higonnet's posture: ______seated ______standing ______prone

Diagrams:



Notes:

Test Data:

(Console sheets, Photographs, Diagnostics, Operator remarks, other.)

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: GRAPHICS Number: I.3.7

Date of Approval: 2 June 1971 Page 1 of 1

Work Statement References: 3.4.1 (page 21) Running Time ___

Test Conditions: X OM X MO X MM ___ MS ___ SM

Number of Vehicles 6 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders about 60

Constraints: Waiting Time = ___ (min.)

Travel Time = ___ D + ___ (min.)

Total Time = ___ D + ___ (min.)

Purpose:

To determine that the graphics display as present in the ODAR, provides the functions described in the reference below.

Description:

During the execution of the Realistic Case (Cambridge) scenario (I.2.6) the ARDS screen will be observed and/or photographed at the points indicated by an asterisk (*) in the chronological listing.

Expected Result:

The first two functions described in the reference will be verified.

Reference: Letter of 31 March, 1971, N. Wilson, MIT/USL to J. Bellanto DOT/TSC.

OPERATIONAL DIAL-A-RIDE PROGRAM

ACCEPTANCE TEST SCENARIO

Scenario Name: Standing Requests Number: I.3.8

Date of Approval: 2 June 71 Page 1 of 1

Work Statement References: 3.4.1 (page 21) Running Time ___

Test Conditions: X OM X MO X MM ___ MS ___ SM

Number of Vehicles 6 Vehicle Capacity 10

Mean Vehicle Speed 15 (mph) Number of Riders About 60

Constraints: Waiting Time = ___ (min.)

Travel Time = ___ D + ___ (min.)

Total Time = ___ D + ___ (min.)

Purpose:

To demonstrate that the ODAR program will satisfactorily handle standing requests.

Description:

During the execution of the Realistic Case (Cambridge) Scenario (I.2.6), thirty-five standing requests will be entered in the Dial-A-Ride system prior to actual scheduling operation.

Expected Result:

During the scheduling of vehicles during the Realistic Case (Cambridge) Scenarios, the standing requests entered prior to scheduling operation will be properly handled along with all of the passenger requests originating during system operation.

APPENDIX A

TEST HARDWARE CONFIGURATION

APPENDIX A

TEST HARDWARE CONFIGURATION

The ODAR Acceptance Text will be conducted on either an IBM 360/50 or an IBM 360/67 except as otherwise specified in the scenarios with the following minimal features:

256 K bytes of high speed core
universal instruction set
high speed printer, card reader, card punch
1 2314 disk drive
1 2702 telecommunications control unit
1 ARDS (Advanced Remote Display Station)
8 KSR 33 or 35 telecommunications terminals

APPENDIX B

TEST INPUT FILES

APPENDIX B

TEST INPUT FILES

This appendix contains the eight input parameter files (FT02F001 files) called for in the test scenarios. The appropriate file for each scenario is specified on page 2 of the scenario sheets, under "References", and is also given in the following table

INPUT FILE	#VEH	GRID/CAMB	TEST
1	2	GRID	I.2.2.-1; I.2.2.-2a,b,c; I.2.2.-3; I.2.2.-5; I.2.2.-6; I.2.2.-8; I.2.2.-9; I.2.2.-11; I.2.2.-12; I.2.2.-13; I.2.2.-14; I.2.2.-15
2	4	GRID	I.2.2.-7
3	20	CAMB	I.2.4; I.3.2; I.3.3; I.3.4.
4	2	GRID	I.3.5
5	2	GRID	I.3.6
6	6	CAMB	I.2.6.-2
7	2	CAMB	I.2.3a
8	8	GRID	I.2.3b

```
FILE: ONE          SYSIN      01


// JOB RUN THE CARS SYSTEM (FILE 1)
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// DLBL IJSYS06,'PRIMARY GRID DATA FILE',99/350
// EXTENT SYS006,234079,1,,3060,40
// DLBL IJSYS07,'SECONDARY GRID DATA FILE',99/350
// EXTENT SYS007,234079,1,,3100,40
// ASSGN SYS008,X'130'
// DLBL IJSYS08,'GRID DUPS FILE',99/350
// EXTENT SYS008,234079,1,,3940,20
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02E'
// ASSGN SYS024,X'0EC'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01     5   00.0
   10    10    10    10    10    10
ACCEPTANCE TEST INPUT FILE ONE
 2 3     7  000 0 1 0
 0    2   8    5.  .01    0.  000.   00.0
 0.50 1.0   4.0
 1 1.0 0.0 0.0
 60. 1.0  60.  1.0  60.
  0.0   0.0    0  0.0
 1 1 1    0.    0.    15.
 0 0 1 1   2.
0 0 ST
0 0 ST
/*
/&
```

```
FILE: TWO         SYSIN     P1


// JOB RUN THE CARS SYSTEM (FILE 2)
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// DLBL IJSYS06,'PRIMARY GRID DATA FILE',99/350
// EXTENT SYS006,234079,1,,3060,40
// DLBL IJSYS07,'SECONDARY GRID DATA FILE',99/350
// EXTENT SYS007,234079,1,,3100,40
// ASSGN SYS008,X'130'
// DLBL IJSYS08,'GRID DUPS FILE',99/350
// EXTENT SYS008,234079,1,,3940,20
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02E'
// ASSGN SYS024,X'0EE'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01     5  00.0
   10   10   10   10   10   10
ACCEPTANCE TEST INPUT FILE TWO
 2 3     7  000  0 1 0
 0   2  8   5.  .01    0.  999.   00.0
 0.50 1.0   4.0
 1 1.0 0.0 0.0
  3. 1.0   3.  1.0   6.
  0.0   0.0    0   0.0
 1 1 1   0.    0.    15.
 0 0 1 1   2.
0 60 ST
20 0 ST
/*
/&
```

```
FILE: THREE     SYSIN     P1

// JOB RUN THE CARS SYSTEM (FILE 3)
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// ASSGN SYS008,X'130'
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02F'
// ASSGN SYS024,X'0EE'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01     5  00.0
   20    20    20    20    20    20
ACCEPTANCE TEST INPUT FILE THREE
 2 3     7  000 0 0
 0  20   8  4.0 .019  0. 990.  00.0
 0.50 1.20   4.0
 1 1.0
 30. 1.5  10.  1.5  40.
  0.0   0.0  25  0.0
 1 1 1   0.    0.    15.
 2 0 1 1  2.
 3.5 .4   .5
 4.5  .4  .5
```

```
           MIT
           12 CENTRAL SQ
           CARS
           B.U. BRIDGE
           14 PLYMPTON ST
           365 WESTERN AV
           MORSE SCHOOL
           700 MEMORIAL DR
           600 GREEN ST
           23 CENTRAL SQ
           83 PLEASANT ST
           50 WINTHROP ST
           3 MT.AUBURN ST
           27 HAYWARD ST
           132 ERIE ST
           FRONT ST
           29 BOW ST
           12 PETERS ST
           PILGRIM ST
           7 LOPEZ ST


   D- AO&AF-/8N O G -;FO/8N &AF-/8N O G -;FOBT  OGGOOAK O G -;FO&AF-/8N
BT  OGGOOAK O G V+AO-SAOOG&OV*GO1 GOBT
/*
/&
```

```
FILE: FOUR      SYSIN    P1


// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// DLBL IJSYS06,'PRIMARY GRID DATA FILE',99/350
// EXTENT SYS006,234079,1,,3060,40
// DLBL IJSYS07,'SECONDARY GRID DATA FILE',99/350
// EXTENT SYS007,234079,1,,3100,40
// ASSGN SYS008,X'130'
// DLBL IJSYS08,'GRID DUPS FILE',99/350
// EXTENT SYS008,234079,1,,3940,20
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02E'
// ASSGN SYS024,X'0EE'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01    5  00.0
   10   10   10   10   10   10
ACCEPTANCE TEST INPUT FILE FOUR
 2 3    7  000 0 1 0
 0   4  8   5. .01   0. 999.  00.0
 0.50 1.0   4.0
 1 1.0 0.0 0.0
  3. 1.0   3.  1.0   6.
  0.0  0.0   0  0.0
 1 1 1   0.   0.   15.
 0 0 1 1  2.
50 50 ST
50 50 STA
50 50 ST
50 50 ST
/*
/&
```

```
FILE: FIVE     SYSIN    P1


// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// DLBL IJSYS06,'PRIMARY GRID DATA FILE',99/350
// EXTENT SYS006,234079,1,,3060,40
// DLBL IJSYS07,'SECONDARY GRID DATA FILE',99/350
// EXTENT SYS007,234079,1,,3100,40
// ASSGN SYS008,X'130'
// DLBL IJSYS08,'GRID DUPS FILE',99/350
// EXTENT SYS008,234079,1,,3940,20
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02E'
// ASSGN SYS024,X'0FE'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01    5  00.0
   10   10   10   10   10   10
ACCEPTANCE TEST INPUT FILE FIVE
 2 3    7  000 0 1 0
 0   2  8   5. .01   0. 999.  00.0
 0.50 1.0   4.0
 2 0.5 0.5 0.0
  6. 1.5   2.  1.5   8.
  6. 1.0   1.  1.0   3.
  0.0  0.0   0  0.0
 1 1 1   0.   0.   15.
 0 0 1 1  2.
0 0 ST
0 0 ST
/*
/&
```

```
FILE: SIX       SYSIN    P1


// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// ASSGN SYS008,X'130'
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02F'
// ASSGN SYS024,X'0FF'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01    5  00.0
   20   20   20   20   20   20
ACCEPTANCE TEST INPUT FILE SIX
 2 3    7  000 1 1 0
 0   6 10  4.0 .019  0. 999.  00.0
 0.50 1.20  4.0  4.1  1.0
 3 0.4 0.3 0.3
 15. 1.5   5.  1.5   5.
 10. 1.3   3.  1.3   3.
  5. 1.3   5.  1.3  10.
  0.0  0.0  25  0.0
 1 1 1   0.   0.   15.
 0 0 1 1  2.
MIT
12 CENTRAL SQ
KENDALL SQ
B.U. BRIDGE
14 PLYMPTON ST
344 RIVER ST
```

```
DSRA1                         1 FRONT ST                - -
  ? V            |B<    A    A     A
DSRA2                         15 AMES ST                8 6
  ? V            |C%    A    A     A
DSRA3                         10 ALBANY ST              5 6
  ? V            |CN    A    A     A
DSRA4                         64 STATE ST               1 ?
  ? V            |DE    A    A     A
DSRA5                         30 GRANITE ST             E 0
  ? V            |D5    A    A     A
DSRA6                         29 CROSS ST               Z >
  ? V            |D;    A    A     A
DSRA7                         1 FRANKLIN ST             Y 7
  ? V            |F+    A    A     A-

DSRA8                         1 CENTRAL SQ              > 0
  ? V            |F=    A    A     A-
DSRA9                         30 RIVER ST               Y M
  ? V            |FG    A    A     A-
DSRA10                        700 MEMORIAL DR           E +
  ? V            |F     A    A     A-
DSRA11                        11 PUTNAM AV              % :
  ? V            |F0    A    A     A0
DSRA12                        70 PUTNAM AV              Y '
  ? V            |GR    A    A     A0
DSRA13                        50 RIVER ST               W K
  ? V            |GI    A    A     A0
DSRA14                        4 GRANT ST                7 6
  ? V            |G9    A    A     A0
DSRA15                        370 GREEN ST              % M
  ? V            |HS    A    A     A0
DSR1                          10 SMART ST               > ?
  ? V            |HK    A    A     BR
DSR2                          20 AUDREY ST              ( _
  ? V            |IB    A    A     BR
DSR3                          MIT                         #
  ? V            |I.    A    A     BR
DSR4                          35 SIDNEY ST              Z W
  ? V            |I#    A    A     B;
DSR5                          100 AUBURN ST             W :
  ? V            | 4    A    A     B;
DSR6                          79 FRANKLIN ST            Y 7
  ? V            | )    A    A     B;
DSR7                          58 ALLSTON ST             L /
  ? V            |.(    A    A     B;
DSR8                          100 MEMORIAL DR           9 <
  ? V            |.'    A    A     BT
DSR9                          600 MEMORIAL DR           G ,
  ? V            |.W    A    A     BT
```

```
   DSR10                       9 KINNAIRD ST          D
     ? V              |<0    A   A    BT
   DSMA1                       MIT                    #
     E *              |<F    A   A    A&
   DSMA2                       HARVARD SQ           ? V
     F *              |<|    A   A    A&
   DSMA3                       5 WADSWORTH ST       = <
     E *              |("    A   A    A&
   DSMA4                       2 FRONT ST           - -
     E *              |(Y    A   A    A-
   DSMA5                       700 GREEN ST         , 9
     F *              |+/    A   A    A-
   DSMA6                       10 COWPERTHWAITE ST  W 6
     F *              |+J    A   A    A0
   DSMA7                       100 AUBURN ST        W ;
     E *              ||A    A   A    A0
   DSMA8                       10 COTTAGE ST        S 0
     E *              ||     A   A    BM
   DSMA9                       CENTRAL SQ           > 0
     E *              ||     A   A    BR
   DSMA10                      50 LOPEZ ST          / )


     E *              |&     A   A    B:
/*
/*
/*
/&
```

```
FILE: SEVEN      SYSIN     P1


// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// ASSGN SYS008,X'130'
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02F'
// ASSGN SYS024,X'0FF'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01     5  00.0
   20    20    20    20    20    20
ACCEPTANCE TEST INPU FILE SEVEN
 2 3     7  000 0 1
 0  02  8  4.0 .019  0. 999.   00.0
 0.50 1.40  4.0
 2 0.5 0.5
 30. 1.5  15.  1.5  30.
  5. 1.3   5.  1.3  10.
  0.0  0.0  25  0.0
 1 1 1    0.    0.    15.
 0 0 1 1  2.
CARS
CITY HALL
/*
/*
/*
/&
```

```
FILE: EIGHT    SYSIN    P1

// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// DLBL IJSYS06,'PRIMARY GRID DATA FILE',99/350
// EXTENT SYS006,234079,1,,3060,40
// DLBL IJSYS07,'SECONDARY GRID DATA FILE',99/350
// EXTENT SYS007,234079,1,,3100,40
// ASSGN SYS008,X'130'
// DLBL IJSYS08,'GRID DUPS FILE',99/350
// EXTENT SYS008,234079,1,,3940,20
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02E'
// ASSGN SYS024,X'0EE'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
COLD
DATA STARTS HERE
01    5  00.0
   10   10   10   10   10   10
ACCEPTANCE TEST INPUT FILE EIGHT
 2 3    7  000 0  1 0
 0   2  8   5. .01   0. 999.  00.0
 0.50 1.0   4.0
 1 1.0 0.0 0.0
  4. 1.5   3.  1.5   7.
  0.0  0.0   0  0.0
 1 1 1   0.   0.   15.
 0 0 1 1  2.
0 0 ST
0 0 ST
/*
/&
```

APPENDIX C

CAMBRIDGE AND GRID FILES

File: Cambridge Data P1

```
 BRIDGE         BU  000  999  191   36
ACORN           ST    6   27  156   14
ALBANY          ST   10   10  182   53
ALBANY          ST   50   91  180   47
ALBANY          ST  115  140  177   42
ALBANY          ST  143  195  174   36
ALBANY          ST  224  298  171   27
ALLSTON         ST   57   99  161   19
ALLSTON         ST  137  171  156   19
ALLSTON         ST  198  240  151   19
AMES            ST    1    5  199   54
AMES            ST   12   50  182   56
AMESBURY        ST  000  999  172   11
ANGLIM          ST  000  999  169   21
ARROW           ST    1   23  115   47   U
ATHENS          ST    9   31  116   42   U
AUBURN          ST  100  135  158   38
AUBURN          ST  146  174  153   38
AUDREY          ST  000  999  173   13
B SHOP          SU  000  999  175   44
BANKS           ST    7   49  119   43   D
BANKS           ST   54   68  120   40   D
BANKS           ST   90  118  122   38   D
BANKS           ST  132  208  124   35
BANKS           ST  216  226  127   30
BLANCHE         ST    4    4  168   43
BLANCHE         ST   36   58  168   41
BLANCHE         ST   77   77  167   38
BOW             ST    2   12  113   47   U
BOW             ST   14   45  112   45   U
BOW             ST   49   49  109   45

BROOKLINE       ST    2   21  160   44
BROOKLINE       ST   23   37  160   42
BROOKLINE       ST   41   59  160   39
BROOKLINE       ST   61   91  160   36
BROOKLINE       ST   93  110  160   34
BROOKLINE       ST  113  125  160   32
BROOKLINE       ST  128  160  160   29
BROOKLINE       ST  162  195  160   26
BROOKLINE       ST  201  219  159   22
BROOKLINE       ST  225  239  159   20
BROOKLINE       ST  246  271  159   17
BROOKLINE       ST  272  302  158   14
BROOKLINE       ST  305  322  158   10
BROOKLINE       ST  343  353  158    7
CA              YM  000  999  144   47
CARLETON        ST    1   72  198   60
```

CENTRAL	SQ	0	999	150	46	
CHESTNUT	ST	19	19	165	12	
CHESTNUT	ST	45	80	160	12	
CHESTNUT	ST	97	142	156	12	
CHESTNUT	ST	152	185	151	12	
COTTAGE	ST	3	24	152	34	
COWPERTHWAITE	ST	1	16	118	38	
CROSS	ST	25	30	174	41	
CULTY CLUB	FA	000	999	208	65	
DEACON	ST	5	5	106	61	
DECATUR	ST	10	32	157	30	
DEWOLFE	ST	3	8	113	42	U
DEWOLFE	ST	25	28	114	38	U
DOCK	ST	3	32	105	60	
DUNSTER	ST	11	30	103	45	U
DUNSTER	ST	45	54	104	42	D
DUNSTER	ST	69	85	104	40	D
EMILY	ST	000	999	162	28	
ERIE	ST	2	40	166	23	
ERIE	ST	99	103	161	23	
ERIE	ST	131	191	157	24	
ERIE	ST	194	226	152	24	
FRANKLIN	ST	1	80	169	42	
FRANKLIN	ST	87	89	166	42	
FRANKLIN	ST	129	129	163	42	
FRANKLIN	ST	180	206	158	41	
FRANKLIN	ST	216	255	153	41	
FRANKLIN	ST	280	286	149	42	D
FRANKLIN	ST	300	367	143	42	D
FRANKLIN	ST	377	461	137	42	D
FRANKLIN	ST	469	514	132	42	D
FRANKLIN	ST	524	619	127	42	D
FRONT	ST	000	999	173	45	
GLENWOOD	AV	11	38	150	8	
GRANITE	ST	1	11	156	5	
GRANITE	ST	25	25	154	5	
GRANITE	ST	29	59	150	5	
GRANT	ST	4	16	118	41	
GRANT	ST	21	27	115	40	
GREEN	ST	5	38	170	42	
GREEN	ST	54	56	167	42	
GREEN	ST	87	145	163	42	
GREEN	ST	176	223	158	43	
GREEN	ST	349	380	148	44	U
GREEN	ST	410	442	144	44	U
GREEN	ST	444	527	138	44	U
GREEN	ST	536	574	132	44	U
GREEN	ST	581	667	126	44	U
GREEN	ST	694	702	121	43	
GROVE	AV	18	18	165	17	

HAMILTON	ST	66	90	161	21	
HAMILTON	ST	113	162	156	22	
HAMILTON	ST	174	222	152	22	
HARVARD	SQ	000	999	101	47	
HASTINGS	SQ	1	8	157	10	
HAYWARD	ST	1	51	200	62	
HENRY	ST	38	38	164	10	
HENRY	ST	47	75	160	8	
HENRY	ST	82	122	156	9	
HOLYOKE	ST	2	26	105	46	U
HOLYOKE	ST	30	50	106	42	U
I.T.	M.	000	999	187	42	
KENDALL	SQ	000	999	201	66	
KINNAIRD	ST	3	18	132	42	
KINNAIRD	ST	27	53	139	39	U
KINNAIRD	ST	54	87	134	40	U
KINNAIRD	ST	82	126	129	39	U
LAFAYETTE	SQ	000	999	163	45	
LANSDOWNE	ST	7	13	172	43	
LANSDOWNE	ST	26	31	171	40	
LANSDOWNE	ST	37	76	169	36	
LAWRENCE	ST	2	35	152	29	
LICE DEPT.	PO	000	999	148	42	
LINDEN	ST	3	17	108	46	U
LOPEZ	ST	6	51	157	33	
MAGAZINE	ST	5	5	151	45	
MAGAZINE	ST	8	11	151	42	
MAGAZINE	ST	12	21	150	40	
MAGAZINE	ST	22	26	150	38	
MAGAZINE	ST	30	35	150	36	
MAGAZINE	ST	39	50	150	33	
MAGAZINE	ST	55	66	150	31	
MAGAZINE	ST	69	75	150	28	
MAGAZINE	ST	77	84	149	26	
MAGAZINE	ST	89	92	149	23	
MAGAZINE	ST	95	112	149	21	
MAGAZINE	ST	114	127	148	18	
MAGAZINE	ST	128	139	148	14	
MAGAZINE	ST	140	152	148	11	
MAGAZINE	ST	153	174	148	9	
MAGAZINE	ST	177	184	148	7	
MAGAZINE	ST	207	207	147	4	
MAIN	ST	1	218	205	69	
MAIN	ST	226	254	200	65	

MAIN	ST	285	310	198	64	
MAIN	ST	321	336	195	63	
MAIN	ST	343	410	193	62	
MAIN	ST	413	491	190	60	
MAIN	ST	600	624	191	55	
MAIN	ST	640	680	177	53	
MAIN	ST	730	770	174	51	
MAIN	ST	781	905	168	48	
MASS	AV	1	116	187	42	
MASS	AV	134	177	180	44	
MASS	AV	180	259	175	44	
MASS	AV	265	334	170	45	
MASS	AV	351	355	167	45	
MASS	AV	360	480	163	45	
MASS	AV	485	560	158	46	
MASS	AV	563	639	153	46	
MASS	AV	647	750	148	46	
MASS	AV	751	830	144	47	
MASS	AV	836	912	138	47	
MASS	AV	921	960	132	47	
MASS	AV	975	1013	132	46	
MASS	AV	1016	1052	124	46	
MASS	AV	1054	1112	120	46	U
MASS	AV	1116	1256	114	48	U
MASS	AV	1268	1290	108	48	U
MASS	AV	1300	1326	106	48	U
MASS	AV	1329	1356	104	47	U
MASS	AV	1374	1390	101	47	U
MASSACHUSETTS	AV	1	116	187	42	
MASSACHUSETTS	AV	134	177	180	44	
MASSACHUSETTS	AV	180	259	175	44	
MASSACHUSETTS	AV	265	334	170	45	
MASSACHUSETTS	AV	351	355	167	45	
MASSACHUSETTS	AV	360	480	163	45	
MASSACHUSETTS	AV	485	560	158	46	
MASSACHUSETTS	AV	563	639	153	46	
MASSACHUSETTS	AV	647	750	148	46	
MASSACHUSETTS	AV	751	830	144	47	
MASSACHUSETTS	AV	836	912	138	47	
MASSACHUSETTS	AV	921	960	132	47	
MASSACHUSETTS	AV	975	1013	132	46	
MASSACHUSETTS	AV	1016	1052	124	46	
MASSACHUSETTS	AV	1054	1112	120	46	U
MASSACHUSETTS	AV	1116	1256	114	48	U
MASSACHUSETTS	AV	1268	1290	108	48	U
MASSACHUSETTS	AV	1300	1326	106	48	U
MASSACHUSETTS	AV	1329	1356	104	47	U
MASSACHUSETTS	AV	1374	1390	101	47	U
MCTERNAN	ST	5	26	152	27	

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MEMORIAL          DR     1    50   208    65
MEMORIAL          DR    70   111   204    57
MEMORIAL          DR   124   160   197    46
MEMORIAL          DR   305   320   191    36
MEMORIAL          DR   350   372   188    31
MEMORIAL          DR   380   428   185    26
MEMORIAL          DR   500   550   180    18
MEMORIAL          DR   560   560   174    10
MEMORIAL          DR   575   600   171     7
MEMORIAL          DR   619   640   164     3
MEMORIAL          DR   727   763   142     6
MEMORIAL          DR   772   816   136    13
MEMORIAL          DR   820   846   130    20
MEMORIAL          DR   889   889   126    27
MEMORIAL          DR   900   900   122    32
MEMORIAL          DR   935   935   117    36
MEMORIAL          DR   950   950   112    37
MEMORIAL          DR   958   971   106    35
MERRIAM           ST   300   999   166    25
MT.AUBURN         ST     3    10   119    45   D
MT.AUBURN         ST    11    22   117    44   D
MT.AUBURN         ST    23    34   114    44   D
MT.AUBURN         ST    45    53   111    44   D
MT.AUBURN         ST    57    63   109    43   D
MT.AUBURN         ST    65    74   107    43   D
MT.AUBURN         ST    75    76   104    43   D
MT.AUBURN         ST    78    91   102    43   D
NEWTON            ST     2    12   151    14
OSBORN            ST     2     2   178    48
OSBORN            ST    45    45   176    50
PACIFIC           ST    20    20   162    33
PACIFIC           ST    60    61   166    33
PACIFIC           ST    90   110   170    32
PEARL             ST    20    24   157    44
PEARL             ST    30    48   157    42
PEARL             ST    52    67   157    40
PEARL             ST    68    88   155    38
PEARL             ST    92   102   155    35
PEARL             ST   104   126   155    33
PEARL             ST   128   148   154    30
PEARL             ST   150   170   154    28
PEARL             ST   172   199   154    25
PEARL             ST   196   209   154    23
PEARL             ST   214   234   154    20
PEARL             ST   236   263   154    17
PEARL             ST   264   291   153    14
PEARL             ST   295   310   153    11
PEARL             ST   312   333   153     9
```

PER RIGHT	UP	0	999	205	75	
PERRY	ST	5	23	152	36	
PETERS	ST	6	22	161	17	
PILGRIM	ST	000	999	167	35	
PLEASANT	ST	1	6	146	45	U
PLEASANT	ST	10	17	146	43	U
PLEASANT	ST	19	24	145	40	U
PLEASANT	ST	25	44	145	37	D
PLEASANT	ST	45	54	144	33	D
PLEASANT	ST	57	68	144	30	D
PLEASANT	ST	72	82	144	28	D
PLEASANT	ST	83	96	143	25	D
PLEASANT	ST	99	111	143	23	D
PLEASANT	ST	113	126	143	21	D
PLEASANT	ST	130	148	143	18	
PLEASANT	ST	152	164	142	15	
PLEASANT	ST	170	176	142	12	
PLYMPTON	ST	1	30	110	47	D
PLYMPTON	ST	58	103	111	40	D
PORTLAND	ST	33	33	180	52	
PPI VILLAGE	VA	000	999	122	32	
PUTNAM	AV	11	23	122	44	
PUTNAM	AV	27	42	124	42	
PUTNAM	AV	45	71	125	40	
PUTNAM	AV	74	90	126	38	
PUTNAM	AV	120	120	128	36	
PUTNAM	AV	131	151	129	35	
PUTNAM	AV	156	189	130	30	
PUTNAM	AV	231	281	134	25	
PUTNAM	AV	340	386	140	18	
PUTNAM	AV	396	431	160	17	
PUTNAM	AV	456	492	165	16	
PUTNAM	AV	500	549	161	16	
PUTNAM	AV	561	600	156	15	
PUTNAM	AV	602	625	151	15	
RIVER	ST	25	49	148	40	D
RIVER	ST	53	77	146	38	D
RIVER	ST	82	103	145	36	D
RIVER	ST	107	154	144	34	D
RIVER	ST	156	183	141	31	D
RIVER	ST	188	215	140	29	D
RIVER	ST	222	241	140	28	D
RIVER	ST	244	263	139	26	D
RIVER	ST	267	308	138	24	D
RIVER	ST	313	374	135	19	D
ROCKINGHAM	ST	8	34	155	7	
RS	CA	000	999	200	62	
RSE SCHOOL	MD	000	999	156	5	

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SALEM          ST     1   15  156   37
SIDNEY         ST    32   36  166   41
SIDNEY         ST    79   84  165   36
SIDNEY         ST   128  128  164   30
SIDNEY         ST   143  171  164   26
SIDNEY         ST   179  179  163   22
SIDNEY         ST   197  210  163   20
SIDNEY         ST   220  240  163   17
SIDNEY         ST   257  265  163   13
SIDNEY         ST   283  300  162   10
SMART          ST   000  999  175   46
SOUTH          ST    17   19  103   39   U
SPERIDAKIS     TE     1   41  156   26
ST OFFICE      PO   000  999  144   47
STATE          ST    64   64  175   49
T              MI   000  999  187   42
TY HALL        CI   000  999  144   47
TUDOR          ST    15   27  162   31
TUFTS          ST    11   35  150   10
U. BRIDGE      B.   000  999  191   36


VALENTINE      ST    11   34  157   28
VASSAR         ST     9   74  185   51
VASSAR         ST    95  301  176   30
VASSAR         ST   304  304  170   14
VASSAR         ST   317  361  168   10
WADSWORTH      ST     5   30  204   62
WADSWORTH      ST    60   60  202   64
WATSON         ST     3   26  158   35
WAVERLY        ST    40   40  167   20
WAVERLY        ST   169  169  167   16
WESTERN        AV     5   27  148   42   U
WESTERN        AV    44  111  145   40   U
WESTERN        AV   114  149  142   38   U
WESTERN        AV   150  179  140   36   U
WESTERN        AV   189  215  138   34   U
WESTERN        AV   217  272  136   32   U
WESTERN        AV   275  310  134   30   U
WESTERN        AV   316  338  132   29   U
WESTERN        AV   343  369  130   26   U
WESTERN        AV   373  381  128   25   U
WILLIAM        ST     2   25  153   37
WINDSOR        ST    11   37  174   46
WINDSOR        ST    60   60  172   40
WINTHROP       ST    41   41  105   41
WINTHROP       ST    65   75  102   41
WER LEFT       LO     0  999  100    0
YCE CHEN       JO   000  999  180   18
                     -1
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FORM
0                 ST     0     5     0     0
0                 ST     6    15    10     0
0                 ST    16    25    20     0
0                 ST    26    35    30     0
0                 ST    36    45    40     0
0                 ST    46    55    50     0
0                 ST    56    65    60     0
0                 ST    66    75    70     0
0                 ST    76    85    80     0
0                 ST    86    95    90     0
0                 ST    96   100   100     0
10                ST     0     5     0    10
10                ST     6    15    10    10
10                ST    16    25    20    10
10                ST    26    35    30    10
10                ST    36    45    40    10
10                ST    46    55    50    10
10                ST    56    65    60    10
10                ST    66    75    70    10
10                ST    76    85    80    10
10                ST    86    95    90    10
10                ST    96   100   100    10
20                ST     0     5     0    20
20                ST     6    15    10    20
20                ST    16    25    20    20
20                ST    26    35    30    20
20                ST    36    45    40    20
20                ST    46    55    50    20
20                ST    56    65    60    20
20                ST    66    75    70    20
20                ST    76    85    80    20
20                ST    86    95    90    20
20                ST    96   100   100    20
30                ST     0     5     0    30
30                ST     6    15    10    30
30                ST    16    25    20    30
30                ST    26    35    30    30
30                ST    36    45    40    30
30                ST    46    55    50    30
30                ST    56    65    60    30
30                ST    66    75    70    30
30                ST    76    85    80    30
30                ST    86    95    90    30
30                ST    96   100   100    30
40                ST     0     5     0    40
40                ST     6    15    10    40
40                ST    16    25    20    40
40                ST    26    35    30    40
40                ST    36    45    40    40
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40                    ST    46    55    50    40
40                    ST    56    65    60    40
40                    ST    66    75    70    40
40                    ST    76    85    80    40
40                    ST    86    95    90    40


40                    ST    96   100   100    40
50                    ST     0     5     0    50
50                    ST     6    15    10    50
50                    ST    16    25    20    50
50                    ST    26    35    30    50
50                    ST    36    45    40    50
50                    ST    46    55    50    50
50                    ST    56    65    60    50
50                    ST    66    75    70    50
50                    ST    76    85    80    50
50                    ST    86    95    90    50
50                    ST    96   100   100    50
60                    ST     0     5     0    60
60                    ST     6    15    10    60
60                    ST    16    25    20    60
60                    ST    26    35    30    60
60                    ST    36    45    40    60
60                    ST    46    55    50    60
60                    ST    56    65    60    60
60                    ST    66    75    70    60
60                    ST    76    85    80    60
60                    ST    86    95    90    60
60                    ST    96   100   100    60
70                    ST     0     5     0    70
70                    ST     6    15    10    70
70                    ST    16    25    20    70
70                    ST    26    35    30    70
70                    ST    36    45    40    70
70                    ST    46    55    50    70
70                    ST    56    65    60    70
70                    ST    66    75    70    70
70                    ST    76    85    80    70
70                    ST    86    95    90    70
70                    ST    96   100   100    70
80                    ST     0     5     0    80
80                    ST     6    15    10    80
80                    ST    16    25    20    80
80                    ST    26    35    30    80
80                    ST    36    45    40    80
80                    ST    46    55    50    80
80                    ST    56    65    60    80
80                    ST    66    75    70    80
80                    ST    76    85    80    80
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80                    ST    86    95    90    80
80                    ST    96   100   100    80
90                    ST     0     5     0    90
90                    ST     6    15    10    90
90                    ST    16    25    20    90
90                    ST    26    35    30    90
90                    ST    36    45    40    90
90                    ST    46    55    50    90
90                    ST    56    65    60    90
90                    ST    66    75    70    90
90                    ST    76    85    80    90
90                    ST    86    95    90    90

90                    ST    96   100   100    90
100                   ST     0     5     0   100
100                   ST     6    15    10   100
100                   ST    16    25    20   100
100                   ST    26    35    30   100
100                   ST    36    45    40   100
100                   ST    46    55    50   100
100                   ST    56    65    60   100
100                   ST    66    75    70   100
100                   ST    76    85    80   100
100                   ST    86    95    90   100
100                   ST    96   100   100   100
```

APPENDIX D

INITIALIZATION PROCEDURES

APPENDIX D

INITIALIZATION PROCEDURES

The purpose of this appendix is to provide a listing of the documents which describe the procedures that were used in the initialization and conduct of the acceptance tests. The following three documents contain the information required to conduct acceptance testing of the Operational DOS Program:

1. MIT Urban Systems Laboratory Report entitled, "Operational DOS Program User's Manual", dated July, 1971.

   This document describes the operating procedures for using the operational Dial-A-Ride program including a complete description of the options available to the operator of the program.

2. MIT Urban Systems Laboratory Report entitled, "A Manual Backup System Handbook for Dial-A-Ride", dated July, 1971.

   This document describes a manual backup system for Dial-A-Ride which is to be used in the event of a computer malfunction including a detailed description of the procedures to be used to restart the computer-controlled system from the manual backup mode when the computer comes back into operation.

3. MIT Urban Systems Laboratory Report entitled, "Operational DOS Program Description", (Four Volumes) dated July, 1971.

This set of volumes provides a complete description of the operational DOS program for Dial-A-Ride including documentation of all of the subroutines with complete flow charts.

APPENDIX E

REFERENCE LETTERS

APPENDIX E

REFERENCE LETTERS

The purpose of this appendix is to provide a copy of all of the letters containing additional information which are referenced in the various acceptance test scenarios.

This appendix specifically includes the following letters which are referenced in the scenarios indicated:

1. Letter to Mr. Juan Bellantoni from Mr. E. H. Porter, Jr., dated July 23, 1971, which transmitted data used for consisting calculations and which provided a recommended criteria for the consistency tests.

   This letter is referenced in Scenario 1.2.3a, entitled, "Delivery and Pickup Restraints (Consistency)".

2. Letter to Mr.Juan Bellantoni from Mr. E. H. Porter, Jr., dated July 22, 1971, which transmitted documents and suggested references pertaining to the passenger reassignment capability of the Dial-A-Ride system.

   This letter is referenced in Scenario 1.3.5, entitled, "Lateness Detection and Correction".

3. Letter to Mr. Juan Bellantoni from Mr. E. H. Porter, Jr., dated July 22, 1971, which provided additional information on the priority class feature of the Dial-A-Ride system.

   This letter is referenced in Scenario 1.3.6, entitled "Priority Classes".

4. Letter to Mr. Juan Bellantoni from Prof. Nigel Wilson dated March 31, 1971, which provided additional information on the graphics display capability of the Dial-A-Ride system.

   This letter is referenced in Scenario 1.3.7, entitled, "Graphics".

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
1861

URBAN SYSTEMS LABORATORY
OFFICE OF THE DIRECTOR

CAMBRIDGE, MASSACHUSETTS 02139
BUILDING E-40

23 July 1971

Mr. Juan Bellantoni
Transportation Systems Center
Department of Transportation
55 Broadway
Cambridge, Massachusetts 02142

Dear Mr. Bellantoni:

Attached for your information is a copy of the data taken from actual driving tests in Cambridge, Massachusetts, which we used in the calculations required in Scenario I.2.3a and b. The enclosed data were extracted from student project reports completed in the fall of 1970.

The criteria we recommend for the consistency test is as follows:

a. For passenger pickup:

90% of the passengers will be picked up within ±6 min of the stated pickup time and 75% will be picked up within ±3 min of the stated time.

b. For passenger delivery:

95% of the passengers will be delivered within ±8 min of the stated delivery time and 75% will be delivered within ±5 min of the stated time.

Should you have any questions on the above, please contact me.

Sincerely yours,

Edwin H. Porter, Jr.
Manager, Project CARS

EHP/rf
Enclosures
cc: C. Broxmeyer/UMTA
D. Roos
N. Wilson
M. Solomita

Rec'd 26 July 1971.

MORNING RUSH HOURS

[illegible]

[illegible]	OBSERVATION 1	2	3	4	5	6
M.I.T. ( )	2.16	1.83	2.00	2.16	1.91	2.16
MAIN/[illegible] ( )	2.25	1.83	1.93	2.08	1.25	2.33
MASS/[illegible] ( )	.50	1.58	0.50	0.58	0.41	0.50
[illegible] ( )	1.33	0.83	2.41	1.66	1.66	1.58
GREENWAY (C)	1.75	1.25	1.58	2.25	1.50	1.66
HARVARD CIR (A)	5.41	4.50	4.75	2.41	4.16	4.16
HOLYOKE CNTR ( )	2.66	2.53	2.66	1.83	2.75	4.25
1033 MASS AV ( )	2.25	2.16	2.75	1.83	2.75	4.25
INMAN SQ ( )	4.08	4.66	2.83	2.66	3.58	12.66
MANLEY ST (F)	3.33	3.25	3.08	2.66	2.66	2.83
PRESR/[illegible]TL (F)	4.25	3.41	3.33	3.33	3.00	3.41
THIRD/SPRING (H)	4.33	4.00	3.33	4.58	3.83	4.08
N.A.S.A. (G)	2.08	2.33	2.00	1.83	2.33	1.83
TECH SQ ( )	2.08	1.91	1.08	0.91	1.25	1.66
KENDALL ST (G)	3.00	2.83	2.33	2.25	2.33	2.08

MID MORNING

	1	2	3	4	5
[illegible]	[illegible]	[illegible]	[illegible]	1.91	[illegible]
[illegible]	[illegible]	[illegible]	2.06	1.83	1.41
[illegible]	[illegible]	[illegible]	0.41	[illegible]	0.58
[illegible]	2.33	2.16	[illegible]	2.83	1.91
[illegible]	1.41	1.00	1.41	1.25	1.58
[illegible]	5.16	4.25	4.75	6.59	5.66
[illegible]	2.33	2.25	2.93	4.50	4.50
[illegible]	2.66	1.91	2.33	2.75	3.50
[illegible]	3.58	2.91	[illegible]	2.00	4.50
[illegible]	1.83	4.66	2.75	5.75	3.41
[illegible] ST (I)	2.91	1.25	3.50	2.08	2.33
[illegible] HILL (I)	5.66	4.00	3.66	5.25	3.50
THIRD/SPRING (I)	1.83	1.75	1.91	1.83	2.16
N.A.S.A. ( )	1.33	0.91	0.91	1.58	0.83
[illegible]	[illegible]	1.50	1.75	2.41	1.83
K[illegible]BALLS (G)					

LUNCH

[illegible]	[illegible]	2	3	4	5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1.75	1.61	[illegible]	[illegible]	1.33
[illegible]	[illegible]	[illegible]	[illegible]	1.00	1.09
[illegible]	1.66	[illegible]	2.50	[illegible]	2.83
[illegible]	1.91	[illegible]	1.75	1.50	1.58
[illegible]	[illegible]	5.91	5.41	6.50	7.59
[illegible]	5.00	5.25	4.73	5.16	4.50
HOLYOKE ([illegible])	[illegible]	4.50	[illegible]	[illegible]	3.25
[illegible]	[illegible]	[illegible]	[illegible]	4.41	3.66
[illegible]	3.50	3.83	[illegible]	[illegible]	4.25
[illegible]EY ST ([illegible])	3.58	2.83	3.75	4.16	[illegible]
[illegible]	5.50	4.41	[illegible]	5.25	5.25
THIRD/SPRING ([illegible])	5.83	2.58	[illegible]	1.66	2.25
N.A.S.A. ([illegible])	0.00	1.08	1.16	0.91	1.00
TECH SQ ([illegible])	0.00	1.58	[illegible]	2.00	1.83

[illegible]

MID AFTERNOON

[illegible]	OBSERVATION 1	2	3	4	5	6	7	8	9	10
[illegible] ( )										
	3.08	2.28	3.00	2.33	2.75	2.23	2.40	1.58	2.81	2.8[illegible]
M.I.T. ( )										
	2.41	1.35	0.95	1.75	1.66	1.33	0.86	2.76	1.55	1.33
[illegible] (G)										
	0.61	0.81	1.05	0.66	0.75	2.00	0.76	1.28	0.81	0.68
[illegible] (G)										
	2.[illegible]	2.23	1.76	2.83	2.25	2.48	3.06	2.43	3.23	2.30
[illegible] (G)										
	1.65	1.31	1.76	1.25	1.41	1.06	1.61	1.58	1.73	1.55
[illegible] (G)										
	[illegible].78	5.46	3.66	[illegible].33	11.00	6.75	6.78	6.98	6.91	[illegible].73
HARVARD C[illegible] (G)										
	3.41	4.30	4.71	10.08	4.41	4.33	3.63	6.86	5.21	3.6[illegible]
HOLYOKE C[illegible] ( )										
	3.31	3.03	2.01	2.33	1.75	2.10	2.48	1.75	2.73	1.9[illegible]
1033 MASS AV ( )										
	[illegible].50	2.91	3.91	5.00	3.66	3.53	4.76	4.10	5.60	3.3[illegible]
[illegible] SQ ( )										
	3.75	3.35	3.76	2.41	3.25	4.16	4.86	1.45	3.21	2.9[illegible]
[illegible] ST (G)										
	2.36	3.53	2.28	2.75	2.91	3.16	2.76	2.13	2.71	3.0[illegible]
[illegible]/[illegible] (F)										
	3.83	4.55	4.16	4.00	7.25	6.08	6.41	5.25	4.31	4.0[illegible]
THIRD/SPRING (F)										
	2.00	1.58	1.73	1.83	1.83	1.53	1.98	2.31	1.60	1.9[illegible]
N.[illegible].S.A. (G)										
	1.33	1.41	1.08	1.66	1.08	1.43	1.36	1.51	0.00	1.4[illegible]
TECH SQ (G)										
	1.41	2.66	1.90	1.58	1.75	2.36	1.90	1.41	1.45	1.61
KENDALL SQ (G)										

LATE AFTERNOON

[illegible]	OBSERVATION 1	2	3	4	5
M.I.T. ( )	[illegible]	5.33	2.33	2.50	2.50
[illegible] ( )	2.[illegible]3	3.41	2.75	2.25	3.50
MAIN/[illegible] ( )	0.75	0.50	1.75	1.16	0.66
CENTRAL ( )	2.33	2.00	1.91	5.33	3.66
GREEN/[illegible] (C)	1.[illegible]	2.08	1.58	10.41	1.41
HARVARD [illegible] ( )	6.50	5.08	7.25	24.50	6.41
HOLYOKE CTR (A)	4.50	3.33	5.58	11.58	4.66
1033 MASS AV ( )	7.08	3.25	6.00	5.08	4.33
INMAN SQ ( )	2.41	2.41	4.00	2.41	2.33
MARNEY ST ( )	4.91	3.00	3.41	2.08	2.75
BRKSR/BRISTL ( )	3.08	3.08	3.50	2.16	2.58
THIRD/SPRING (F)	6.25	3.58	5.58	2.66	8.91
N.A.S.A. (G)	2.83	3.08	3.50	1.83	2.41
TECH SQ. ( )	1.75	1.16	1.41	1.33	1.33
KENDALL ST (G)	2.58	2.33	3.00	2.00	1.83

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TIMES OBSERVED WERE
                            OBSERVATION
DESCRIPTION                  1      2      3      4      5
KENDALL SQ       (G)
                            2.28   3.00   2.33   2.75   2.23     77 MASS
M.I.T.           (G)
                            1.55   0.95   1.75   1.66   1.33
MAIN/WINDSOR     (D)
                            0.81   1.05   0.66   0.75   2.00
MAIN/MASS        (D)                                             425 MASS
                            2.23   1.76   3.03   2.25   2.48
CENTRAL SQ       (B)                                             CENTRAL SQ
                            1.31   1.76   1.25   1.41   1.06
GREEN/BAY        (C)
                            5.46   8.46   9.33  11.00   6.75
HARVARD COOP     (A)
                            4.30   4.41  10.08   4.41   4.33
HOLYOKE CNTR     (A)
                            3.03   2.01   3.33   1.75   2.10
1033 MASS AV     (B)
                            2.91   3.81   5.00   2.66   3.53
INMAN SQ         (B)
                            3.35   3.36   3.41   3.25   4.16
MARNEY ST        (D)
                            3.53   2.38   2.75   2.91   3.16
BRKSR/BRISTL     (D)
                            4.55   4.16   4.00   7.25   6.08
THIRD/SPRING     (F)
                            1.58   1.33   1.93   1.83   1.53
N.A.S.A.         (G)
                            1.41   1.08   1.66   1.08   1.43
TECH SQ          (D)
                            2.66   1.90   1.58   1.75   2.36
KENDALL SQ       (G)
                            2.40   1.58   2.38   2.81   2.88
M.I.T.           (G)
                            0.86   2.76   1.15   1.55   1.93
MAIN/WINDSOR     (D)
                            0.76   1.28   0.61   0.81   0.68
MAIN/MASS        (D)
                            3.06   2.43   1.48   3.23   2.30
CENTRAL SQ       (B)
                            1.61   1.58   1.53   1.73   1.58
GREEN/BAY        (C)
                            6.78   6.98   7.05   6.81   9.73
HARVARD COOP     (A)
                            3.63   6.86   5.21   5.21   3.63
HOLYOKE CNTR     (A)
                            2.48   1.75   1.98   2.73   1.93
1033 MASS AV     (B)
                            4.76   4.10   2.71   5.60   3.38
INMAN SQ         (B)
                            4.86   1.45   0.00   3.21   2.95
MARNEY ST        (D)
                            2.76   2.13   0.00   2.71   3.06
BRKSR/BRISTL     (D)
                            6.41   5.25   0.00   4.31   4.03
THIRD/SPRING     (F)
                            1.98   2.31   0.00   1.60   1.98
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  N.A.S.A.       (G)
                          1.36   1.51   0.00   0.00   1.45
  TECH SQ        (G)
                          1.00   1.41   0.00   1.45   1.61
  KENDALL SQ     (G)
                          0.00   0.00   0.00   0.00   0.00
✓ BUTTON LOT     (G)
                          5.66   3.33   0.00   0.00   0.00
✓ THIRD/HURLEY   (F)
                          9.00   9.41   0.00   0.00   0.00
x BROADWAY/LEE   (G)
                          7.00   6.66   0.00   0.00   0.00
✓ PACIFIC/LAND   (E)
                          2.66   6.00   0.00   0.00   0.00
✓ WESTRN/HOWRD   (C)
                         10.91   4.41   0.00   0.00   0.00
✓ HARVARD SQ.    (A)
                         10.25   4.16   0.00   0.00   0.00
  WESTRN/DODGE   (C)
                          6.25   0.00   0.00   0.00   0.00
x HARVARD/PINE   (D)
                          5.00   0.00   0.00   0.00   0.00
✓ MCTERN/PEARL   (E)
                          2.50   0.00   0.00   0.00   0.00
✓ STOP & SHOP    (E)
                         15.05   0.00   0.00   0.00   0.00
✓ HARVARD SQ.    (A)
                          1.65   0.00   0.00   0.00   0.00
✓ WBSTR/SECKEL   (D)
                          4.38   0.00   0.00   0.00   0.00
✓ LECHMERE'S     (F)
                          5.66   0.00   0.00   0.00   0.00
  FIFTH/POTTER   (F)
                         11.45   0.00   0.00   0.00   0.00
  BURNS PLGRND   (C)
                          5.21   0.00   0.00   0.00   0.00
✓ FUZZ STATION   (C)
                          6.41   0.00   0.00   0.00   0.00
✓ MIT/77 MA AV   (G)
                          1.83   0.00   0.00   0.00   0.00
✓ JOYCE CHEN     (G)
                          2.25   0.00   0.00   0.00   0.00
✓ EMILY/BRKLNE   (E)
                          7.83   0.00   0.00   0.00   0.00
✓ SIXTH/SPRING   (F)
                          7.25   0.00   0.00   0.00   0.00
x RINDGE TECH    (B)
                          7.58   0.00   0.00   0.00   0.00
✓ MIT/77 MA AV   (G)
                          5.58   0.00   0.00   0.00   0.00
✓ H TRUST C SQ   (B)
                         11.58   0.00   0.00   0.00   0.00
? MTAUB/HOLYCK   (A)
                          9.41   0.00   0.00   0.00   0.00
✓ JAMES/MASON    (A)
                          7.00   0.00   0.00   0.00   0.00
  BRDWY/COLUMB   (D)
                          2.00   0.00   0.00   0.00   0.00
  PRTLAND/MAIN   (D)
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Number of persons

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                          3.58   0.00   0.00   0.00   0.00
BURTON LOT    (G)
                          5.66   0.00   0.00   0.00   0.00
PRTLAND/MAIN  (D)
                          1.46   0.00   0.00   0.00   0.00
BRDWY/COLUMB  (E)
                          7.76   0.00   0.00   0.00   0.00
JAMES/MASON   (A)
                          2.65   0.00   0.00   0.00   0.00
MTAUB/HOLYCK  (A)
                          4.78   0.00   0.00   0.00   0.00
H TRUST C SQ  (B)
                          3.90   0.00   0.00   0.00   0.00
MIT/77 MA AV  (G)
                          7.83   0.00   0.00   0.00   0.00
RINDGE TECH   (B)
                          6.01   0.00   0.00   0.00   0.00
SIXTH/SPRING  (F)
                          8.60   0.00   0.00   0.00   0.00
EMILY/BRKLNE  (E)
                          4.01   0.00   0.00   0.00   0.00
JOYCE CHEN    (G)
                          3.16   0.00   0.00   0.00   0.00
MIT/77 MA AV  (G)
                          4.16   0.00   0.00   0.00   0.00
FUZZ STATION  (C)
                          3.16   0.00   0.00   0.00   0.00
BURNS PLGRND  (C)
                         13.08   0.00   0.00   0.00   0.00
FIFTH/POTTER  (F)
                          2.08   0.00   0.00   0.00   0.00
LECHMERE'S    (F)
                          5.66   0.00   0.00   0.00   0.00
WBSTR/SECKEL  (D)
                         11.00   0.00   0.00   0.00   0.00
HARVARD SQ.   (A)
                          6.75   0.00   0.00   0.00   0.00
STOP & SHOP   (E)
                          1.91   0.00   0.00   0.00   0.00
MCTERN/PEARL  (E)
                          4.91   0.00   0.00   0.00   0.00
HARVARD/PINE  (D)
                          5.83   0.00   0.00   0.00   0.00
WESTRN/DODGE  (C)
                          4.33   2.76   0.00   0.00   0.00
HARVARD SQ.   (A)
                          6.83   7.46   0.00   0.00   0.00
WESTRN/HOWRD  (C)
                          5.66   5.25   0.00   0.00   0.00
PACIFIC/LAND  (E)
                          7.75   4.86   0.00   0.00   0.00
BROADWAY/LEE  (B)
                          7.00   7.55   0.00   0.00   0.00
THIRD/HURLEY  (F).
                          3.08   4.16   0.00   0.00   0.00
BURTON LOT    (G)
                          0.00   0.00   0.00   0.00   0.00
VASSAR/MASS   (G)
                          2.96   2.16   0.00   0.00   0.00
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out of service

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  SAILING PAV   (G)
                               0.71   0.66   0.00   0.00   0.00
  KENDALL SQ    (G)
                               0.41   0.68   0.00   0.00   0.00
  NASA BLDG     (G)
                               4.41   3.95   0.00   0.00   0.00
  LECHMERE MTA  (F)
                               4.00   2.66   0.00   0.00   0.00
  BENT & SIXTH  (F)
                               2.58   3.10   0.00   0.00   0.00
  TECH SQUARE   (D)
                               2.08   1.48   0.00   0.00   0.00
  HARVAD/CLARK  (D)
                               2.41   2.16   0.00   0.00   0.00
  MAIN/WINDSOR  (D)
                               3.25   4.46   0.00   0.00   0.00
  SIMEONE'S     (E)
                               2.83   2.65   0.00   0.00   0.00
  CITY HALL     (E)
                               1.83   2.15   0.00   0.00   0.00
  FUZZ STATION  (C)
                               3.08   2.11   0.00   0.00   0.00
  VALTNE/PEARL  (E)
                               0.41   1.55   0.00   0.00   0.00
  BELL COURT    (E)
                               4.83   5.30   0.00   0.00   0.00
  WESTGATE      (G)
                               2.50   2.60   0.00   0.00   0.00
  STOP & SHOP   (E)
                               2.25   1.85   0.00   0.00   0.00
  KENWD/ALSTON  (E)
                               2.83   3.20   0.00   0.00   0.00
  CALNDR/MAGEE  (C)
                               2.91   3.21   0.00   0.00   0.00
  DUNSTER HSE   (C)
                               2.08   1.95   0.00   0.00   0.00
  PUTNAM/GREEN  (C)
                               3.41   3.63   0.00   0.00   0.00
  CAMB LIBRARY  (B)
                               1.41   1.33   0.00   0.00   0.00
  H G HOSPITAL  (B)
                               0.75   1.96   0.00   0.00   0.00
  MEMORIAL HLL  (A)
                               2.50   3.70   0.00   0.00   0.00
  BRATL CINEMA  (A)
                               5.50   3.00   0.00   0.00   0.00
  LOWELL HOUSE  (A)
                               2.50   1.58   0.00   0.00   0.00
  ATHENS/GRANT  (C)
                               3.16   1.88   0.00   0.00   0.00
  ELLERY/HAVRD  (B)
                               1.33   2.28   0.00   0.00   0.00
  LNGFELOW SCH  (B)
                               2.33   1.08   0.00   0.00   0.00
  ST. MARY'S    (D)
                               4.16   2.91   0.00   0.00   0.00
  FUZZ STATION  (C)
                               2.83   1.45   0.00   0.00   0.00
  LOPEZ/PEARL   (E)
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                          3.50   4.80   0.00   0.00   0.00
  CAMB YWCA      (B)
                          3.33   3.71   0.00   0.00   0.00
  SENNOTT PARK   (D)
                          0.83   1.41   0.00   0.00   0.00
  NEWTOWNE CRT   (D)
                          2.33   3.63   0.00   0.00   0.00
  TECH COOP      (G)
                          2.25   1.90   0.00   0.00   0.00
  ALBANY/CROSS   (E)
                          5.41   6.05   0.00   0.00   0.00
  BINNEY/FULKE   (F)
                          2.56   1.91   0.00   0.00   0.00
  FIFTH/SPRING   (F)
                          0.83   1.53   0.00   0.00   0.00
  LECHMERE'S     (F)
                          1.66   2.00   0.00   0.00   0.00
  E40-SLOANLOT   (G)
                          2.91   2.73   0.00   0.00   0.00
  LECHMERE'S     (F)
                          1.58   1.43   0.00   0.00   0.00
  FIFTH/SPRING   (F)
                          1.75   2.11   0.00   0.00   0.00
  BINNEY/FULKE   (F)
                          2.91   4.66   0.00   0.00   0.00
  ALBANY/CROSS   (E)
                          1.58   2.90   0.00   0.00   0.00
  TECH COOP      (G)
                          3.00   1.90   0.00   0.00   0.00
  NEWTOWNE CRT   (D)
                          2.91   2.50   0.00   0.00   0.00
  SENNOTT PARK   (D)
                          1.91   2.80   0.00   0.00   0.00
  CAMB YWCA      (B)
                          3.41   2.01   0.00   0.00   0.00
  LOPEZ/PEARL    (E)
                          2.50   2.53   0.00   0.00   0.00
  FUZZ STATION   (C)
                          2.66   2.50   0.00   0.00   0.00
  ST. MARY'S     (D)
                          1.83   2.25   0.00   0.00   0.00
  LNGFELOW SCH   (B)
                          0.50   1.36   0.00   0.00   0.00
  ELLERY/HAVRD   (B)
                          6.00   3.63   0.00   0.00   0.00
  ATHENS/GRANT   (C)
                          6.58   6.11   0.00   0.00   0.00
  LOWELL HOUSE   (A)
                          4.58   3.25   0.00   0.00   0.00
  BRATL CINEMA   (A)
                          4.91   3.35   0.00   0.00   0.00
  MEMORIAL HLL   (A)
                          1.08   1.50   0.00   0.00   0.00
  H G HOSPITAL   (D)
                          1.33   1.28   0.00   0.00   0.00
  CAMB LIBRARY   (B)
                          3.66   4.75   0.00   0.00   0.00
  PUTNAM/GREEN   (C)
                          1.66   1.26   0.00   0.00   0.00
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DUNSTER HSE    (C)
                      4.16   4.21   0.00   0.00   0.00
CALNDR/MAGEE   (C)
                      2.66   2.65   0.00   0.00   0.00
KENWD/ALSTON   (E)
                      1.58   1.76   0.00   0.00   0.00
STOP & SHOP    (E)
                      2.36   3.03   0.00   0.00   0.00
WESTGATE       (E)
                      4.41   3.35   0.00   0.00   0.00
BELL COURT     (E)
                      2.59   1.86   0.00   0.00   0.00
VALTNE/PEARL   (E)
                      5.41   3.31   0.00   0.00   0.00
FUZZ STATION   (C)
                      2.41   2.30   0.00   0.00   0.00
CITY HALL      (B)
                      4.25   4.60   0.00   0.00   0.00
SIMEONE'S      (E)
                      2.00   2.00   0.00   0.00   0.00
MAIN/WINDSOR   (D)
                      0.83   1.11   0.00   0.00   0.00
HARVAD/CLARK   (D)
                      1.83   2.00   0.00   0.00   0.00
TECH SQUARE    (D)
                      3.08   3.91   0.00   0.00   0.00
BENT & SIXTH   (F)
                      3.16   3.01   0.00   0.00   0.00
LECHMERE MTA   (F)
                      2.83   2.61   0.00   0.00   0.00
NASA BLDG      (G)
                      1.41   1.36   0.00   0.00   0.00
KENDALL SQ     (G)
                      1.58   0.80   0.00   0.00   0.00
SAILING PAV    (G)
                      2.00   2.78   0.00   0.00   0.00
VASSAR/MASS    (G)
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[illegible] Date 9/24/70 Driver Pete S. Weather Fair & Clear

Stop (Route)	Time	Miles	Δ Time
arton Lot (G)	3:15:00	380.8	0:00
rd & Hurley ([illegible])	3:18:20	382.5	3:20
roadway & Lee (B)	3:27:45	383.9	9:25
acific & Landsdowne (C)	3:34:25	385.35	6:40
astern & Howard (C)	3:40:25	386.3	6:00
arvard Sq (A)	3:44:50	387.15	4:25
astern & Dodge (C)	3:49:00	388.1	4:10
rvard & Pine (D)			
lernan & Pearl (E)			
op & Shop (E)			
rvard Sq. (A)			
rn & Sackel (D)			
ommerce Sales (F)			
n & Potter (F)			
rns Playground (G)			
lice Sta. Central Sq. (C)			
T (G)			
ree Chen (G)	2:05:45	369.0	0:00
lly & Brookline (E)	2:08:00	370.0	2:15
& Spring (F)	2:15:50	371.7	7:50
dge Tech (B)	2:23:05	373.35	7:15
(G)	2:30:40	375:15	7:35
vard Trust Centrl Sq. (B)	2:36:15	376.1	5:35
shburn & Holyoke (A)	2:47:50	377.2	11:45
[illegible] (A)	2:57:15	377.7	9:25
dway & Columbia (D)	3:04:15	379.3	&:00
land & Main ([illegible])	3:06:15	379.8	2:00
on Lot (G)	3:09:50	380.5	3:35

DATA SHEET 1.10 CARS STUDY Date 9/24/70 Driver Rich R. Weather Fair & Clear

Stop (Zone)	Time	Miles	Δ Time
urton Lot (G)	2:13:00		0:00
rd & Hurley (F)	2:18:40		5:40
roadway & Lee (B)	2:27:40		9:00
acific & Landsdown (E)	2:34:40	53.10	7:00
estern & Howard (C)	2:37:20	54.05	2:40
arvard Sq. (A)	2:48:15	54.95	10:55
estern & Dodge (C)	2:58:30	55.95	10:15
rvard & Pine (D)	3:04:45	57.25	6:15
clarmen & Pearl (E)	3:09:45	58.30	5:00
top & Shop (E)	3:12:15	58.95	2:30
arvard Sq. (A)	3:27:20	60.45	15:05
e rn & Sackel (D)	3:29:00	62.15	1:40
echmere Sales (F)	3:33:20	63.65	4:20
th & Potter (F)	3:39:00	64.75	5:40
orns Playground (C)	3:50:25	67.05	11:25
olice Sta. Central Sq. (C)	3:55:40	68.10	5:15
IT (G)	4:02:05	68.90	6:25
oyce Chen (G)	4:03:55	69.50	1:50
mily & Brookline (E)			
th & Spring (F)			
odge Tech (B)			
IT (G)			
arvard Trust Contrl Sq. (B)			
. Auburn & Holyoke (A)			
& Mason (A)			
oadway & Columbia (D)			
rtland & Main (D)			
rton Lot (G)			

DATA SHEET 1.10 C?S STUDY Date 9/29/70 Driver Pete S. Weather Rain, cleari at 3:00

Stop (Zone)	Time	Miles	Δ Time
itton Lot (G)	3:48:45	441.45	3:05
rd & Harley (F)	3:45:40	440.1	7:00
roadway & Lee (E)	3:38:40	438.5	7:45
acific & Landsdowne (E)	3:30:55	437.1	5:40
estern & Howard (C)	3:25:15	435.8	6:50
arvard Sq. (A)	3:18:25	433.9	4:20
estern & Dodge (C)	3:14:05	432.8	5:50
arvard & Pine (D)	3:08:15	431.8	4:55
cTernan & Pearl (E)	3:03:20	430.4	1:55
top & Shop (E)	3:01:25	430.2	6:45
arvard Sq. (A)	2:54:40	428.7	11:00
rd & Sackel (D)	2:43:20	426.9	5:40
echmere Sales (F)	2:37:40	425.7	2:05
th & Potter (F)	2:35:357	425.0	13:05
erns Playground (C)	2:22:30	422.1	3:10
olice Sta. Central Sq. (C)	2:19:20	421.3	4:10
IT (G)	2:15:10	420.5	3:10
oyce Chen (G)	2:12:00	419.9	0:00
mily & Brookline (E)			
th & Spring (F)			
ridge Tech (B)			
IT (G)			
arvard Trust Centrl Sq. (B)			
. Auburn & Holyoke (A)			
mason (A)			
roadway & Columbia (D)			
rtland & Main (E)			
rton Lot (G)			

DATA SHEET 1.10 [illegible] Date 9/29/70 Driver Rich R. Weather Rain until 3 clearing after

Stop (Zone)	Time	Miles	Δ Time
ton Lot (G)	2:46:10	23.15	0:00
& Harley (F)	2:42:00	20.45	4:10
adway & Lee (B)	2:34:25	19.80	7:35
ific & Lansdowne (F	2:29:35	18.60	4:50
ters & Howard (C)	2:22:50	17.05	5:15
vard Sq. (A)	2:15:20	15.10	7:30
tern & Ldg. (C)	2:12:35	13.90	2:45
vard & Pine (D)			
ernon & Pearl (E)			
p & Shop (E)			
vard Sq. (A)			
rn & Seckel (D)			
imore Sales (F)			
n & Potter (F)			
ns Playground (C)			
ies Sta. Central Sq. (C)			
. (G)			
ss Onen (G)	3:38:50	36.00	4:00
ly & Brookline (E)	3:34:50	34.55	8:35
& Spring (F)	3:26:15	32.70	6:00
idge Tech (B)	3:20:15	30.95	7:50
T (S)	3:12:25	28.85	3:55
vard Trust Centrl Sq. (B)	3:08:30	28.10	4:45
Auburn & Alyoke (A)	3:03:45	27.20	2:40
& [illegible] (A)	3:01:05	26.50	7:45
adway & Columbia (B)	2:53:20	24.85	1.30
tland & Main (D)	2:51:50	24.30	5:40
ton Lot (G)	2:46:10 197	23.15	4:10

1.10 Data Sheet Date 10/6/70 Driver Pete S. Weather Clear

Stop	Time	Mileage	Δ time
Wadsworth & Amherst	2:21:30	654.3	0:00
1st & Spring	2:24:25	655.3	2:55
5th & Spring	2:26:00	655.6	1:35
Binney & Fulkerson	2:27:45	656.0	1:45
Albany & Cross	2:30:40	656.8	2:55
Stud Cnter	2:32:15	657.2	1:35
Windsor & School	2:35:15	657.6	3:00
Broadway & Norfolk	2:38:10	658.05	2:55
YWCA	2:40:05	658.5	1:55
Pearl & Lopez	2:43:30	659.0	3:25
Police Sta.	2:46:00	659.55	2:30
Harvard & Norfolk	2:48:40	660.05	2:40
Longfellow School	2:50:30	660.5	1:50
Harvard & Ellery	2:51:00	661.0	0:30
Athens & Grant	2:57:00	661.5	6:00
Lowell House	3:03:35	662.35	6:35
Brattle & Church	3:08:10	662.9	4:35
Memorial Hall	3:13:05	663.6	4:55
Cambridge & Hovey	3:14:10	664.0	1:05
Broadway & Trowbridge	3:15:30	664.4	1:20
Green & Putnam	3:19:10	665.4	3:40
Plympton & Memorial	3:20:50	665.8	1:40
Callender & MaGee	3:25:00	666.6	4:10
Allston & Kenwood	3:27:40	667.2	2:40
Stop & Shop	3:29:15	667.8	1:35
Westgate	3:32:20	668.65	3:05
Allston & Grove	3:36:45	669.7	4:25
Valentine & Pearl	3:39:20	670.1	2:35
Police Sta.	3:44:45	671.1	5:25
City Hall	3:47:10	671.5	2:25
Brookline & Green	3:51:25	672.35	4:15
Main & Windsor	3:53:25	672.6	2:00
Clark & Harvard	3:54:15	672.95	0:50
Tech Sq. Polaroid	3:56:05	673.25	1:50
Bent & 6th	3:59:10	674.25	3:05
Lechmere MBTA!	4:02:20	674.9	3:10
NASA (DoT)	4:05:10	675.9	2:50
Main & Wadsworth	4:06:35	676.3	1:25
Yacht club	4:08:10	676.55	1:35
Vassar & Mass. Ave.	4:10:10	677.2	2:00

1.10 Data Sheet Date 10/6/70 Driver Rich R. Weather Fair & Clear

Stop	Time	Mileage	Δ time
Wadsworth & Amherst	3:50:10	22.00	0:00
1st & Spring	3:48:10	21.10	2:00
5th & Spring	3:46:40	20.80	1:30
Binney & Fulkerson	3:44:45	20.35	1:55
Albany & Cross	3:38:40	19.25	6:05
Stud Cnter	3:36:45	19.05	1:55
Windsor & School	3:33:10	18.45	3:35
Broadway & Norfolk	3:31:45	18.00	1:25
YWCA	3:28:00	17.70	3:45
Pearl & Lopez	3:23:10	16.85	4:50
Police Sta.	3:21:45	16.50	1:25
Harvard & Norfolk	3:18:50	16.00	2:55
Longfellow School	3:17:45	15.60	1:05
Harvard & Ellery	3:15:30	15.20	2:15
Athens & Grant	3:13:35	14.75	1:55
Lowell House	3:12:00	14.50	1:35
Brattle & Church	3:09:00	14.05	3:00
Memorial Hall	3:05:20	13.45	3:40
Cambridge & Hovey	3:03:20	13.10	2:00
Broadway & Trowbridge	3:02:00	12.75	1:20
Green & Putnam	2:58:20	12.05	3:40
Plympton & Memorial	2:56:25	11.65	1:55
Callender & MaGee	2:53:10	10.85	3:15
Allston & Kenwood	2:50:00	10.05	3:10
Stop & Shop	2:48:10	9.55	1:50
Westgate	2:45:35	8.65	2:35
Allston & Grove	-------	----	5:20
Valentine & Pearl	2:40:15	7.35	1:35
Police Sta.	2:38:40	6.95	2:05
City Hall	2:36:35	6.55	2:10
Brookline & Green	2:34:25	6.00	2:40
Main & Windsor	2:31:45	5.60	4:30
Clark & Harvard	2:25:10	4.50	2:10
Tech Sq. Polaroid	2:22:50	3.80	1:30
Bent & 6th	2:19:40	3.10	3:05
Lechmere MBTA!	2:17:00	2.35	2:40
NASA (DoT)	2:13:05	1.15	3:55
Main & Wadsworth	2:12:25	1.00	0:40
Yacht club	2:11:40	0.75	0:45
Vassar & Mass. Ave.	2:08:45	99.95	2:55

1.10 Data Sheet Date 10/8/70 Driver Pete S. Weather clear

Stop	Time	Mileage	Δ time
Wadsworth & Amherst	3:17:40	625.4	0:00
1st & Spring	3:16:00	624.5	1:40
5th & Spring	3:15:10	624.1	0:50
Binney & Fulkerson	3:12:30	623.45	2:40
Albany & Cross	3:07:05	622.1	5:25
Stud Cnter	3:04:50	621.9	2:15
Windsor & School	3:02:00	621.5	2:50
Broadway & Norfolk	3:01:10	621.1	0:50
YWCA	2:57:20	620.4	3:50
Pearl & Lopez	2:53:50	619.75	3:30
Police Sta.	25106/24740	619.4/618.8	2.50
Harvard & Norfolk	2:43:30	618.3	4:10
Longfellow School	2:41:10	617.9	2:20
Harvard & Ellery	2:39:50	617.5	1:20
Athens & Grant	2:36:40	617.1	3:10
Lowell House	2:34:10	616.8	2:30
Brattle & Church	2:28:40	616.2	5:30
Memorial Hall	2:26:10	615.65	2:30
Cambridge & Hovey	2:25:25	615.3	0:45
Broadway & Trowbridge	2:24:00	614.95	1:25
Green & Putnam	2:20:35	614.3	3:25
Plympton & Memorial	2:18:30	613.85	2:05
Callender & MaGee	2:15:35	613.1	2:55
Allston & Kenwood	2:12:45	612.4	2:50
Stop & Shop	21030/40230	611.8/636.1	2:15
Westgate	4:00:00	635.25	2:30
Allston & Grove	3:55:10	634.0	4:50
Valentine & Pearl	3:54:45	633.6	0:25
Police Sta.	3:51:40	633.2	3:05
City Hall	3:49:50	632.7	1:50
Brookline & Green	3:47:00	632.25	2:50
Main & Windsor	3:43:45	631.3	3:15
Clark & Harvard	3:41:20	630.9	2:25
Tech Sq. Polaroid	3:39:15	630.25	2:05
Bent & 6th	3:36:40	629.5	2:35
Lechmere MBTA!	3:32:40	628.7	4:00
NASA (DoT)	3:28:15	627.5	4:25
Main & Wadsworth	3:27:50	627.4	0:25
Yacht club	3:27:10	627.2	0:40
Vassar & Mass. Ave.	3:25:00	626.45	2:10

1.10 Data Sheet Date 10/8/70 Driver Rich R. Weather Fair

Stop	Time	Mileage	Δ time
Wadsworth & Amherst	2:57:30	37.70	0:00
1st & Spring	3:00:15	38.55	2:45
5th & Spring	3:01:40	38.90	1:25
Binney & Fulkerson	3:04:05	39.50	2:05
Albany & Cross	3:08:25	40.25	4:40
Stud Cnter	3:11:20	40.65	2:55
Windsor & School	3:13:15	41.05	1:55
Broadway & Norfolk	3:15:45	41.55	2:30
YWCA	3:25:05	43.45	2:50
Pearl & Lopez	3:27:05	44.05	2:00
Police Sta.	3:29:35	44.55	2:30
Harvard & Norfolk	3:32:05	45.05	2:30
Longfellow School	3:34:20	45.70	2:15
Harvard & Ellery	3:35:45	46.10	1:20
Athens & Grant	3:39:20	46.70	3:40
Lowell House	3:45:30	47.55	6:10
Brattle & Church	3:48:45	48.05	3:15
Memorial Hall	3:52:05	48.80	3:20
Cambridge & Hovey	3:53:35	49.15	1:30
Broadway & Trowbridge	3:54:50	49.60	1:15
Green & Putnam	3:59:35	50.65	4:45
Plympton & Memorial	4:00:52	51.05	1:15
Callender & MaGee	4:05:35	51.95	4:15
Allston & Kenwood	4:08:15	52.55	2:40
Stop & Shop	2:17:10	27.55	1:45
Westgate	2:20:00	28.45	2:50
Allston & Grove	2:23:25	28.45	3:20
Valentine & Pearl	2:25:15	28.95	1:50
Police Sta.	2:28:35	29.65	3:20
City Hall	2:30:50	31.10	2:20
Brookline & Green	2:35:30	31.90	4:40
Main & Windsor	2:37:30	32.30	2:00
Clark & Harvard	2:38:35	32.55	1:05
Tech Sq. Polaroid	2:40:35	32.90	2:00
Bent & 6th	2:44:30	33.90	3:55
Lechmere MBTA!	2:47:30	34.65	3:00
NASA (DoT)	2:50:10	35.70	2:40
Main & Wadsworth	2:51:30	36.05	1:20
Yacht club	2:52:20	36.30	0:50
Vassar & Mass. Ave.	2:55:05	36.95	2:45

Times recorded in Ford vehicle along route

Weather sunny and clear for all runs except
cloudy for # 5

	1	2	3	4	5	6	7	8	9	10
ndell Sq	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
I T	02:17	03:00	02:20	02:45	02:14	02:24	01:35	02:23	02:49	02:53
ain/Windsor	04:08	03:57	04:05	04:25	03:34	03:16	04:21	03:32	04:22	04:49
ain/Mass	04:57	05:00	04:45	05:10	05:34	04:02	05:38	04:09	05:11	05:30
entral Sq	07:11	06:46	08:35	07:25	08:03	07:06	08:04	05:38	08:25	07:48
reen/Bay	08:30	08:32	09:50	08:50	09:07	08:43	09:39	07:10	10:09	09:23
rvard Coop	13:58	17:00	19:10	19:50	15:52	15:30	16:38	14:13	16:58	18:07
olycke Ctr	18:16	21:25	29:15	24:15	20:12	19:08	23:31	19:26	22:11	21:45
033 Mass Ave	21:18	23:26	32:35	26:00	22:18	21:37	25:16	21:25	24:55	23:41
nman Sq	24:13	27:15	37:35	29:40	25:50	26:23	29:22	24:08	30:31	27:04
arney St	27:34	30:37	40:55	32:55	30:00	31:15	31:49	------	33:44	31:01
hr/Bristl	31:06	33:00	43:40	35:50	33:10	34:01	33:57	-----	36:27	34:05
hird/Spring	35:37	37:10	47:40	43:05	39:15	37:26	38:12	-----	40:46	38:07
A S A	37:12	38:30	49:30	44:55	40:47	39:25	40:31	------	42:22	40:06
ech Sq	38:37	39:35	51:10	46:00	42:13	40:47	42:02	------	42:22*	41:33
endall Sq	41:17	41:29	52:45	47:45	44:35	42:41	43:27	------	43:49	43:10

*Neglected to start watch after N A S A stop

Fig. 1

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

URBAN SYSTEMS LABORATORY
OFFICE OF THE DIRECTOR

CAMBRIDGE, MASSACHUSETTS 02139
BUILDING E-40

22 July 1971

Mr. Juan Bellantoni
Transportation Systems Center
Department of Transportation
55 Broadway
Cambridge, Massachusetts 02142

Dear Mr. Bellantoni:

Forwarded for your information are the following documents:

1. CARS Memo AL-40, Subject: Reassignment, dated November 5, 1969, by Mr. H. Weinblatt.
2. Mr. J. D. Kennedy's Master of Science Thesis Entitled, "Utility Maximization Algorithms for Dynamic Routing".

The above two references should provide you with the information you desired in regard to the reassignment feature of our Dial-A-Ride computer programs.

The information on reassignment is also summarized in Section 5.2.5 of our report, USL-TR-70-13, "Scheduling Algorithms for A Dial-A-Ride System", dated March, 1971. Said document is part of our final report documentation on Project CARS.

Should you have any additional questions, please contact me.

Sincerely yours,

Edwin H. Porter, Jr.
Manager, Project CARS

EhP/rf
Enclosures
cc: C. Broxmeyer/UMTA
D. Roos
N. Wilson
M. Solomita

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
1861

URBAN SYSTEMS LABORATORY
OFFICE OF THE DIRECTOR

CAMBRIDGE, MASSACHUSETTS 02139
BUILDING E-40

22 July 1971

Mr. Juan Bellantoni
Transportation Systems Center
Department of Transportation
55 Broadway
Cambridge, Massachusetts 02142

Dear Mr. Bellantoni:

For your information, the following is a brief description of the priority class feature of DAR and how it operates.

Different qualities of service can be offered (presumably at different fares) to users simultaneously on the DAR system. The algorithmic mechanism for this is through the setting of constraints and through the selection criterion. The selection criterion weights the delay experienced by a passenger by his priority class so that better service will be offered to a passenger if he requests a higher class of service. This is done automatically by the computer program and no special input is necessary. The improved quality service for a certain priority class may also be supplemented by lowering the service constraints for the better class of service. In setting these service constraints, care must be taken not to make them so stringent as to render feasible assignments impossible. A full discussion of the impact of service constraints on service times is provided in the report, "Scheduling Algorithms for a Dial-A-Ride System", USL-TR-70-13, in Section 5.2.2. When using priority classes, it is appropriate to obtain optimal settings for the constraints by running simulations of the system beforehand. In the Acceptance Test, the constraints are set as a result of simulation tests to provide the desired service.

Should you have any additional questions, please contact me or Prof. Nigel Wilson.

Sincerely yours,

Edwin H. Porter, Jr.
Manager, Project CARS

EHP/rf

cc: C. Broxmeyer/UMTA
D. Roos
M. Solomita
N. Wilson

DEPARTMENT OF CIVIL ENGINEERING
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

March 31, 1971

Juan F. Bellantoni
Chief, Analysis and Computation Branch
Transportation Systems Center
55 Broadway
Cambridge, Mass. 02142

Dear Mr. Bellantoni,

In response to your letter of March 19, I send you the following functional description of the ODAR graphics display.

The graphics display (ARDS) as present in the ODAR, serves three main functions:

1. Fast graphical display of any vehicle's committments or activities to monitor system operation and verify correct operation of the computer programs.
2. Demonstrate aspects of current system operation to visitors - an educational aid.
3. Display of vehicle routes to be used in modification of the current algorithm.

It is important for the supervisor of the system operation to be able to monitor aspects of the current state such as vehicle routes; passenger origin-destination desire lines; vehicle positions. With this ability, the supervisor may detect at an early stage unexpected occurrences which may warrant corrective action. Using this aid, he could assist in handling queries of an unusual nature from either drivers or passengers.

During the past two years, MIT has found the graphic display capability most helpful in explaining the Dial-A-Ride concept and answering questions about its actual operation. In an implementation of the system, this capability would continue to be important for these reasons, particularly because of the high visibility desired for such a demonstration. A graphical display exposes the current and evolving system state, and focuses the visitor on important components of the service.

Finally, the display is invaluable in evaluating new algorithms or modifications to the existing algorithm. It is anticipated that new algorithms might be implemented in specific situations and the display would be used as an aid in the design process.

I hope that this will help clarify the aims of the graphics capability. If you have any questions, I'd be glad to go into this further.

Yours sincerely,

Nigel H. M. Wilson

Nigel Wilson
Assistant Professor

NW:mln

cc: E. Porter
D. Roos
M. V. Solomita

O D-A-R ACCEPTANCE TEST

TEST DATA

SECTION I

This section contains reproductions of the teletype console sheets obtained during the tests of 27 May through 24 June, 1971.

1,2.2-1A

```
 zero
10 10 st
50 50 st
154200 CRS0000  ZERO                 V  0001 P  0001 D  0006
arnie
50 50 st
100 50 st
154225 CRS0000 ARNIE                 V  0001 P  0004 D  0009
bob
50 50 st
100 50 st
154243 CRS0000 BOB                   V  0001 P  0004 D  0010
charlie
50 50 st
0 50 st
154309 CRS0000 CHARLIE               V  0001 P  0010 D  0015
```

1,2,2-1B

```
   arnie
50 50 st
0 50 st
154550 CRS0000    ARNIE              V  0001 P  0004 D  0009
bob
50 50 st
100 50 st
154605 CRS0000 BOB                   V  0001 P  0010 D  0015
charlie
50 50 st
100 50 st
154622 CRS0000 CHARLIE               V  0001 P  0010 D  0015
```

I.2.2-1A

```
     LOCA000110 10 ST
154141 CRS0150  VEH0001 AT 10 10 ST
[CARS:
154200 CRS0105 VEH 0001 P   ZERO                 10 10 ST
[CARS:VEHI1
154215 CRS0110 VEH 0001 D   ZERO                 50 50 ST
[CARS:VEHI1
154323 CRS0105 VEH 0001 P  ARNIE                 50 50 ST
[CARS:VEHI1
154334 CRS0105 VEH 0001 P  BOB                   50 50 ST
[CARS:VEHI1
154344 CRS0110 VEH 0001 D  ARNIE                 100 50 ST
[CARS:VEHI1
154355 CRS0110 VEH 0001 D  BOB                   100 50 ST
[CARS:VEHI1
154405 CRS0105 VEH 0001 P  CHARLIE               50 50 ST
[CARS:VEHI1
154417 CRS0110 VEH 0001 D  CHARLIE               0 50 ST
[CARS:VEHI1
154430 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

I.2.2-1B

```
     LOCA00010 0 ST
154529 CRS0150  VEH0001 AT 0 0 ST
[CARS:
154549 CRS0105 VEH 0001 P     ARNIE              50 50 ST
[CARS:VEHI1
154630 CRS0110 VEH 0001 D     ARNIE              0 50 ST
[CARS:VEHI1
154640 CRS0105 VEH 0001 P  BOB                   50 50 ST
[CARS:VEHI1
154651 CRS0105 VEH 0001 P  CHARLIE               50 50 ST
[CARS:VEHI1
154701 CRS0110 VEH 0001 D  BOB                   100 50 ST
[CARS:VEHI1
154712 CRS0110 VEH 0001 D  CHARLIE               100 50 ST
[CARS:VEHI1
154723 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

I.2.2-2B

```
160407 CRS0400 01  005 005
160407 CRS0410 005 01      50 50 ST                 0 50 ST
160407 CRS0400 01  005 005
160427 CRS0410 006 01      50 50 ST               100 50 ST
160427 CRS0400 01  005 005 006 006
160450 CRS0410 007 01      50 50 ST               100 50 ST
160450 CRS0400 01  005 005 006 007 007 006
160500 CRS0400 01  005 006 007 007 006
160511 CRS0400 01  006 007 007 006
160521 CRS0400 01  007 007 006
160532 CRS0400 01  007 006
160544 CRS0400 01  006
```

1.2.2-2A

```
  @arnie
0 0 st
100 0 st
154811 CRS0000 ARNIE                V  0001 P  0001 D  0008
bob
0 0 st
0 60 st
154825 CRS0000 BOB                  V  0001 P  0002 D  0007
charlie
0 0 st
0 100 st
154857 CRS0000 CHARLIE              V  0001 P  0002 D  0010
dan
0 0 st
0 90 st
154914 CRS0000 DAN                  V  0001 P  0003 D  0010
ed
0 0 st
0 80 st
154926 CRS0000 ED                   V  0001 P  0003 D  0010
frank
0 0 st
0 70 st
154940 CRS0000 FRANK                V  0001 P  0003 D  0010
george
0 0 st
100 100 st
154956 CRS0000 GEORGE               V  0001 P  0004 D  0019
```

1.2.2-2B

```
   arnie
0 0 st
100 0 st
155353 CRS0000    ARNIE             V  0002 P  0001 D  0008
bob
0 0 st
100 100 st
155410 CRS0000 BOB                  V  0001 P  0001 D  0010
charlie
0 0 st
0 100 st
155425 CRS0000 CHARLIE              V  0001 P  0002 D  0009
dan
0 0 st
0 90 st
155437 CRS0000 DAN                  V  0001 P  0002 D  0009
3d@ed
0 0 st
0 80 st
155453 CRS0000 ED                   V  0001 P  0003 D  0009
frank
0 0 st
0 70 st
155506 CRS0000 FRANK                V  0001 P  0003 D  0009
george
0 0 st
0 60 st
155518 CRS0000 GEORGE               V  0001 P  0004 D  0009
```

1.2.2-2c

```
    @arnie
0 0 st
100 0 st
155854 CRS0000 ARNIE                V  0001 P  0001 D  0008
bob
0 0 st
100 100 st
155908 CRS0000 BOB                  V  0001 P  0002 D  0014
charlie
0 0 st
0 100 st
155922 CRS0000 CHARLIE              V  0001 P  0002 D  0020
dan
0 0 st
0 90 st
155938 CRS0000 DAN                  V  0001 P  0003 D  0022
ed
0 0 st
0 80 st
155951 CRS0000 ED                   V  0001 P  0003 D  0023
frank
0 0 st
0 70 st
160005 CRS0000 FRANK                V  0001 P  0004 D  0025
george
0 0 st
0 60 st
160017 CRS0000 GEORGE               V  0001 P  0004 D  0026
```

I.2.2-2A

```
     LOCA00010 0 ST
154753 CRS0150  VEH0001 AT 0 0 ST
[CARS:
154811 CRS0105 VEH 0001 P  ARNIE                  0 0 ST
[CARS:VEHI1
155000 CRS0105 VEH 0001 P  BOB                    0 0 ST
[CARS:VEHI1
155011 CRS0105 VEH 0001 P  CHARLIE                0 0 ST
[CARS:VEHI1
155022 CRS0105 VEH 0001 P  DAN                    0 0 ST
[CARS:VEHI1
155034 CRS0105 VEH 0001 P  ED                     0 0 ST
[CARS:VEHI1
155045 CRS0105 VEH 0001 P  FRANK                  0 0 ST
[CARS:VEHI1
155057 CRS0105 VEH 0001 P  GEORGE                 0 0 ST
[CARS:VEHI1
155109 CRS0110 VEH 0001 D  BOB                    0 60 ST
[CARS:VEHI1
155123 CRS0110 VEH 0001 D  FRANK                  0 70 ST
[CARS:VEHI1
155136 CRS0110 VEH 0001 D  ED                     0 80 ST
[CARS:VEHI1
155149 CRS0110 VEH 0001 D  DAN                    0 90 ST
[CARS:VEHI1
155203 CRS0110 VEH 0001 D  CHARLIE                0 100 ST
[CARS:VEHI1
155217 CRS0110 VEH 0001 D  GEORGE                 100 100 ST
[CARS:VEHI1
155230 CRS0110 VEH 0001 D  ARNIE                  100 0 ST
[CARS:VEHI1
155243 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.7.2B

```
    RST02
155320 CRS0240 ENTER VEHICLE LOCATION.
[CARS:0 0 ST
155330 CRS0246 VEHICLE 0002 RESTORED
[CARS:LOCA00010 0 ST
155346 CRS0150  VEH0001 AT 0 0 ST
[CARS:
155353 CRS0105 VEH 0002 P     ARNIE                0 0 ST
[CARS:VEHI1
155410 CRS0105 VEH 0001 P  BOB                     0 0 ST
155524 CRS0105 VEH 0001 P  CHARLIE                 0 0 ST
[CARS:VEHI1
155546 CRS0105 VEH 0001 P  DAN                     0 0 ST
[CARS:VEHI1
155556 CRS0105 VEH 0001 P  ED                      0 0 ST
[CARS:VR#EHI1
155610 CRS0105 VEH 0001 P  FRANK                   0 0 ST
[CARS:VEHI1
155619 CRS0105 VEH 0001 P  GEORGE                  0 0 ST
[CARS:VEHI1
155629 CRS0110 VEH 0001 D  GEORGE                  0 60 ST
[CARS:VEHI1
155639 CRS0110 VEH 0001 D  FRANK                   0 70 ST
[CARS:VEHI1
155649 CRS0110 VEH 0001 D  ED                      0 80 ST
[CARS:VEHI1
155658 CRS0110 VEH 0001 D  DAN                     0 90 ST
[CARS:VEHI1
155710 CRS0110 VEH 0001 D  CHARLIE                 0 100 ST
[CARS:VEHI1
155722 CRS0110 VEH 0001 D  BOB                     100 100 ST
[CARS:VEHI1
155733 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI1#2
155744 CRS0110 VEH 0002 D     ARNIE                100 0 ST
[CARS:VEHI2
155754 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:VEHI2
155802 CRS0125 2    NOT SCHEDULED
[CARS:
```

1.2.2-2C

```
    HOLD2
155819 CRS0330 EXPECTED AT 0000 AT
[CARS:LOCA001 0 0 ST
155846 CRS0150  VEH0001 AT 0 0 ST
[CARS:
155854 CRS0105 VEH 0001 P  ARNIE                  0 0 ST
[CARS:VEHI1
160029 CRS0105 VEH 0001 P  BOB                    0 0 ST
[CARS:VEHI1
160040 CRS0105 VEH 0001 P  CHARLIE                0 0 ST
[CARS:VEHI1
160050 CRS0105 VEH 0001 P  DAN                    0 0 ST
[CARS:VEHI1
160059 CRS0105 VEH 0001 P  ED                     0 0 ST
[CARS:VEHI1
160109 CRS0105 VEH 0001 P  FRANK                  0 0 ST
[CARS:VEHI1
160118 CRS0105 VEH 0001 P  GEORGE                 0 0 ST
[CARS:VEHI1
160128 CRS0110 VEH 0001 D  ARNIE                  100 0 ST
[CARS:VEHI1
160137 CRS0110 VEH 0001 D  BOB                    100 100 ST
[CARS:VEHI1
160148 CRS0110 VEH 0001 D  CHARLIE                0 100 ST
[CARS:VEHI1
160157 CRS0110 VEH 0001 D  DAN                    0 90 ST
[CARS:VEHI1
160208 CRS0110 VEH 0001 D  ED                     0 80 ST
[CARS:VEI#HI1
160221 CRS0110 VEH 0001 D  FRANK                  0 70 ST
[CARS:VEHI1
160231 CRS0110 VEH 0001 D  GEORGE                 0 60 ST
[CARS:VEHI1
160242 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-3

```
   arnie
   0 0 st
   0 0 st
   153654 CRS0002 ZERO TRIP LENGTH - TRY NEW DESTINATION
   quit

    @quit
153725 CRS0003 REQUEST IGNORED ENTER NEW DEMAND
bob
0 0 st
0 100 st
153737 CRS0000 BOB                    V  0001 P  0001 D  0008
charlie
0 0 st
100 100 st
153751 CRS0000 CHARLIE                V  0001 P  0002 D  0014
dan
0 0 st
0 100 st
153811 CRS0000 DAN                    V  0001 P  0002 D  0010
ed
0 0 st
0 100 st
153828 CRS0000 ED                     V  0001 P  0003 D  0011
frank
0 0 st
100 0 st
153845 CRS0000 FRANK                  V  0001 P  0003 D  0022
 @george
0 0 st
0 0 st
153938 CRS0002 ZERO TRIP LENGTH - TRY NEW DESTINATION
quit
153947 CRS0003 REQUEST IGNORED ENTER NEW DEMAND
```

I.2.2-3

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:HOLD2
153622 CRS0330 EXPECTED AT 0000 AT
[CARS:LOCA00010 0 ST
153640 CRS0150  VEH0001 AT 0 0 ST
[CARS:
[CARS:
[CARS:
153737 CRS0105 VEH 0001 P  BOB                 0 0 ST
[CARS:VEHI1
153853 CRS0105 VEH 0001 P  CHARLIE             0 0 ST
[CARS:VEHI1
153906 CRS0105 VEH 0001 P  DAN                 0 0 ST
[CARS:VEHI1
153918 CRS0105 VEH 0001 P  ED                  0 0 ST
[CARS:VEHI1
153929 CRS0105 VEH 0001 P  FRANK               0 0 ST
[CARS:VEHI1
153940 CRS0110 VEH 0001 D  BOB                 0 100 ST
[CARS:VEHI1
153951 CRS0110 VEH 0001 D  DAN                 0 100 ST
[CARS:VEHI1
154002 CRS0110 VEH 0001 D  ED                  0 100 ST
[CARS:VEHI1
154013 CRS0110 VEH 0001 D  CHARLIE             100 100 ST
[CARS:VEHI1
154024 CRS0110 VEH 0001 D  FRANK               100 0 ST
[CARS:VEHI1
154036 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-5

```
   arnie
0 10 st
40 80 st
161134 CRS0000    ARNIE             V  0001 P  0001 D  0008
bob
0 10 st
60 80 st
161153 CRS0000 BOB                  V  0001 P  0001 D  0009
charlie
0 10 st
70 80 st
161211 CRS0000 CHARLIE              V  0001 P  0002 D  0011
dan
0 10 st
70 10 st
161225 CRS0000 DAN                  V  0001 P  0003 D  0016
ed
0 10 st
60 10 st
161243 CRS0000 ED                   V  0001 P  0003 D  0017
frank
0 10 st
70 0 st
161259 CRS0000 FRANK                V  0001 P  0004 D  0019
george
0 10 st
70 90 st
161315 CRS0000 GEORGE               V  0001 P  0004 D  0013
henry
0 10 st
60 0 st
161332 CRS0000 HENRY                V  0001 P  0005 D  0021
```

I.2.2-5.

```
     LOCAO O@LOCA001 0 0 ST
161113 CRS0150  VEH0001 AT 0 0 ST
[CARS:
161134 CRS0105 VEH 0001 P     ARNIE              0 10 ST
[CARS:VEHI1
161344 CRS0105 VEH 0001 P  BOB                   0 10 ST
[CARS:VEHI1
161406 CRS0105 VEH 0001 P  CHARLIE               0 10 ST
VEHI[CARS:VEHI1
161433 CRS0105 VEH 0001 P  DAN                   0 10 ST
[CARS:VEHI1
161445 CRS0105 VEH 0001 P  ED                    0 10 ST
[CARS:VEHI1
161501 CRS0105 VEH 0001 P  FRANK                 0 10 ST
[CARS:VEHI1
161513 CRS0105 VEH 0001 P  GEORGE                0 10 ST
[CARS:VEHI1
161527 CRS0105 VEH 0001 P  HENRY                 0 10 ST
[CARS:VEHI1
161539 CRS0110 VEH 0001 D     ARNIE              40 80 ST
[CARS:VEHI1
161555 CRS0110 VEH 0001 D  BOB                   60 80 ST
[CARS:VEHI1
161607 CRS0110 VEH 0001 D  GEORGE                70 90 ST
[CARS:VEHI1
161622 CRS0110 VEH 0001 D  CHARLIE               70 80 ST
[CARS:VEHI1
161636 CRS0110 VEH 0001 D  DAN                   70 10 ST
[CARS:VEHI1
161649 CRS0110 VEH 0001 D  ED                    60 10 ST
[CARS:VEHI1
161701 CRS0110 VEH 0001 D  HENRY                 60 0 ST
[CARS:VEHI1
161713 CRS0110 VEH 0001 D  FRANK                 70 0 ST
[CARS:VEHI1
161728 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-6

```
  arnie
50 50 st
100 100 st
162923 CRS0000   ARNIE               V  0002 P  0001 D  0007
bob
50 50 st
100 90 st
162942 CRS0000 BOB                   V  0002 P  0002 D  0007
charlie
50 50 st
10 0 st
163000 CRS0000 CHARLIE               V  0001 P  0001 D  0006
dan
50 50 st
50 0 st
163018 CRS0000 DAN                   V  0001 P  0002 D  0006
ed
50 50 st
50 100 st
163037 CRS0000 ED                    V  0002 P  0002 D  0007
frank
50 50 st
0 10 st
163052 CRS0000 FRANK                 V  0001 P  0002 D  0011
george
50 50 st
0 0 st
163108 CRS0000 GEORGE                V  0001 P  0003 D  0011
hank
50 50 st
90 100 st
163124 CRS0000 HANK                  V  0002 P  0003 D  0010
```

I.2.2-6 Continued

```
arnie
50 50 st
100 100 st
163737 CRS0000 ARNIE                   V   0001 P   0002 D   0008
bob
50 50 st
100 90 st
163755 CRS0000 BOB                     V   0001 P   0003 D   0008
charlie
50 50 st
10 0 st
163820 CRS0000 CHARLIE                 V   0002 P   0003 D   0009
dan
50 50 st
50 0 st
163837 CRS0000 DAN                     V   0002 P   0003 D   0008
ed
50 50 st
50 100 st
163911 CRS0000 ED                      V   0001 P   0002 D   0007
frank


50 50 st
0 10 st
163925 CRS0000 FRANK                   V   0002 P   0003 D   0012
george
50 50 st
0 0 st
163939 CRS0000 GEORGE                  V   0002 P   0003 D   0012
hank
50 50 st
90 100 st
164007 CRS0000 HANK                    V   0001 P   0003 D   0010
```

I 2.2-6

```
      LOCA1    50 50 ST
162826 CRS0150   VEH0001 AT 50 50 ST
[CARS:LOCA2    50 50 ST
162911 CRS0150   VEH0002 AT 50 50 ST
[CARS:
162923 CRS0105 VEH 0002 P    ARNIE                50 50 ST
[CARS:
163000 CRS0105 VEH 0001 P  CHARLIE                50 50 ST
[CARS:VEHI1
163134 CRS0105 VEH 0001 P  DAN                    50 50 ST
[CARS:VEHI1
163145 CRS0105 VEH 0001 P  FRANK                  50 50 ST
[CARS:VEHI1
163157 CRS0105 VEH 0001 P  GEORGE                 50 50 ST
[CARS:VEHI1
163210 CRS0110 VEH 0001 D  DAN                    50 0 ST
[CARS:VEHI1
163227 CRS0110 VEH 0001 D  CHARLIE                10 0 ST
[CARS:VEHI1
163243 CRS0110 VEH 0001 D  GEORGE                 0 0 ST
[CARS:VEHI1
163258 CRS0110 VEH 0001 D  FRANK                  0 10 ST
[CARS:VEHI1
163312 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
163324 CRS0105 VEH 0002 P  BOB                    50 50 ST
[CARS:VEHI2
163337 CRS0105 VEH 0002 P  ED                     50 50 ST
[CARS:VEHI2
163350 CRS0105 VEH 0002 P  HANK                   50 50 ST
[CARS:VEHI2
163405 CRS0110 VEH 0002 D  ED                     50 100 ST
[CARS:VEHI2S#
163425 CRS0110 VEH 0002 D  HANK                   90 100 ST
[CARS:VEHI2
163439 CRS0110 VEH 0002 D  BOB                    100 90 ST
[CARS:VEHI2
163453 CRS0110 VEH 0002 D    ARNIE                100 100 ST
[CARS:VEHI2
163508 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

1.3.2-6 cont

```
     LOCA1  70 80 ST
163552 CRS0150  VEH0001 AT 0 80 ST
[CARS:LOCA001 70 80 ST
163612 CRS0150  VEH0001 AT 70 80 ST
[CARS:LOCA002 90 80 ST
163650 CRS0120 002  INVALID
[CARS:LOCA002 90 80 ST
163729 CRS0150  VEH0002 AT 90 80 ST
[CARS:
163737 CRS0105 VEH 0001 P  ARNIE                   50 50 ST
[CARS:
163820 CRS0105 VEH 0002 P  CHARLIE                 50 50 ST
[CARS:VEHI1
164018 CRS0105 VEH 0001 P  BOB                     50 50 ST
[CARS:VEHI1
164029 CRS0105 VEH 0001 P  ED                      50 50 ST
[CARS:VEHI1
164042 CRS0105 VEH 0001 P  HANK                    50 50 ST
[CARS:VEHI1
164055 CRS0110 VEH 0001 D  ED                      50 100 ST
[CARS:VEHI1
164122 CRS0110 VEH 0001 D  HANK                    90 100 ST
[CARS:VEHI1
164140 CRS0110 VEH 0001 D  BOB                     100 90 ST
[CARS:VEHI1
164154 CRS0110 VEH 0001 D  ARNIE                   100 100 ST
[CARS:VEHI1
164206 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
164215 CRS0105 VEH 0002 P  DAN                     50 50 ST
[CARS:VEHI2
164226 CRS0105 VEH 0002 P  FRANK                   50 50 ST
[CARS:VEHI2
164241 CRS0105 VEH 0002 P  GEORGE                  50 50 ST
[CARS:VEHI2
164252 CRS0110 VEH 0002 D  DAN                     50 0 ST
[CARS:VEHI2
164303 CRS0110 VEH 0002 D  CHARLIE                 10 0 ST
[CARS:VEHI2
164315 CRS0110 VEH 0002 D  GEORGE                  0 0 ST
[CARS:VEHI2
164327 CRS0110 VEH 0002 D  FRANK                   0 10 ST
[CARS:VEHI2
164342 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

1.2.2-7

```
pass
arnie
50 50 st
100 100 st
095425 CRS0000 ARNIE                     V  0004 P  0001 D  0007
bob
50 50 st
100 0 st
095438 CRS0000 BOB                       V  0003 P  0001 D  0007
charlie
50 50 st
0 0 st
095454 CRS0000 CHARLIE                   V  0002 P  0001 D  0007
dan
50 50 st
100 10 st
095508 CRS0000 DAN                       V  0003 P  0002 D  0007
ed
50 50 st
0 100 st
095522 CRS0000 ED                        V  0001 P  0001 D  0007
frank
50 50 st
30 70 st
095535 CRS0000 FRANK                     V  0001 P  0002 D  0005
george
50 50 st
0 10 st
095549 CRS0000 GEORGE                    V  0002 P  0002 D  0007
hank
50 50 st
90 100 st
095610 CRS0000 HANK                      V  0004 P  0002 D  0007
ira
50 50 st
0 30 st
095624 CRS0000 IRA                       V  0002 P  0002 D  0007
joe
50 50 st
0@90 0 st
095638 CRS0000 JOE                       V  0003 P  0002 D  0010
```

I.2.2-7

```
     [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
095425 CRS0105 VEH 0004 P  ARNIE              50 50 ST
[CARS:
095438 CRS0105 VEH 0003 P  BOB                50 50 ST
[CARS:
095454 CRS0105 VEH 0002 P  CHARLIE            50 50 ST
[CARS:
095522 CRS0105 VEH 0001 P  ED                 50 50 ST
[CARS:VEHI1
095646 CRS0105 VEH 0001 P  FRANK              50 50 ST
[CARS:VEHI1
095655 CRS0110 VEH 0001 D  FRANK              30 70 ST
[CARS:VEHI1
095705 CRS0110 VEH 0001 D  ED                 0 100 ST
[CARS:VEHI1
095714 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
095722 CRS0105 VEH 0002 P  GEORGE             50 50 ST
[CARS:VEHI2
095733 CRS0105 VEH 0002 P  IRA                50 50 ST
[CARS:VEHI2
095742 CRS0110 VEH 0002 D  IRA                0 30 ST
[CARS:VEHI2
095752 CRS0110 VEH 0002 D  GEORGE             0 10 ST
[CARS:VEHI2
095801 CRS0110 VEH 0002 D  CHARLIE            0 0 ST
[CARS:VEHI2
095811 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:VEHI3
095818 CRS0105 VEH 0003 P  DAN                50 50 ST
[CARS:VEHI3
095828 CRS0105 VEH 0003 P  JOE                50 50 ST
[CARS:VEHI3
095837 CRS0110 VEH 0003 D  DAN                100 10 ST
[CARS:VEHI3
095847 CRS0110 VEH 0003 D  BOB                100 0 ST
[CARS:VEHI3
095856 CRS0110 VEH 0003 D  JOE                90 0 ST
[CARS:VEHI3
095906 CRS0115 VEH 0003 NOW UNASSIGNED
[CARS:VEHI4
095914 CRS0105 VEH 0004 P  HANK               50 50 ST
[CARS:VEHI4
095924 CRS0110 VEH 0004 D  HANK               90 100 ST
[CARS:VEHI4
095934 CRS0110 VEH 0004 D  ARNIE              100 100 ST
[CARS:VEHI4
095948 CRS0115 VEH 0004 NOW UNASSIGNED
[CARS:
```

1.2.2-8

```
 @arnie
0 50 st
50 50 st
164529 CRS0000 ARNIE                      V  0001 P  0003 D  0008
bob
100 50 st
50 50 st
164548 CRS0000 BOB                        V  0001 P  0009 D  0014


      HOLD 2
164433 CRS0330 EXPECTED AT 0000 AT
[CARS:LOCA001 0 0 ST
164513 CRS0150  VEH0001 AT 0 0 ST
[CARS:
164529 CRS0105 VEH 0001 P  ARNIE                     0 50 ST
[CARS:VEHI1
164704 CRS0110 VEH 0001 D  ARNIE                     50 50 ST
[CARS:VEHI1
164717 CRS0105 VEH 0001 P  BOB                       100 50 ST
[CARS:VEHI1
164731 CRS0110 VEH 0001 D  BOB                       50 50 ST
[CARS:VEHI1
164747 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

```
       VEHI2
164757 CRS0125 2    NOT SCHEDULED
[CARS:
```

1.2.2-9

```
pass
arnie
0 50 st
50 50 st
085101 CRS0000 ARNIE                V  0001 P  0003 D  0008
bob
100 50 st
50 50 st
085114 CRS0000 BOB                  V  0001 P  0009 D  0014
charlie
20 50 st
50 50 st
085127 CRS0000 CHARLIE              V  0001 P  0004 D  0009
dan
80 50 st
50 50 st
085139 CRS0000 DAN                  V  0001 P  0011 D  0015
```

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:LOCA000150 50 ST
083636 CRS0150  VEH0001 AT 50 50 ST
[CARS:LOCA000250 50 ST
083648 CRS0150  VEH0002 AT 50 50 ST
[CARS:LOCA003 50 50 ST
083703 CRS0120 003  INVALID
[CARS:
```

1.2.2-9

```
[[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
```

```
[[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:HOLD2
085013 CRS0330 EXPECTED AT 0000 AT
[CARS:
085101 CRS0105 VEH 0001 P  ARNIE               0 50 ST
[CARS:VEHI1
085150 CRS0105 VEH 0001 P  CHARLIE             20 50 ST
[CARS:VEHI1
085205 CRS0110 VEH 0001 D  ARNIE               50 50 ST
[CARS:VEHI1
085214 CRS0110 VEH 0001 D  CHARLIE             50 50 ST
[CARS:VEHI1
085224 CRS0105 VEH 0001 P  BOB                 100 50 ST
[CARS:VEHI1
085233 CRS0105 VEH 0001 P  DAN                 80 50 ST
[CARS:VEHI1
085242 CRS0110 VEH 0001 D  BOB                 50 50 ST
[CARS:VEHI1
085252 CRS0110 VEH 0001 D  DAN                 50 50 ST
[CARS:VEHI1
085301 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-11

A

```
dummy
0 0 st
20 0 st
085351 CRS0000 DUMMY                    V  0001 P  0001 D  0004
arnie
40 0 st
20 0 st
085414 CRS0000 ARNIE                    V  0001 P  0003 D  0007
bob
20 03@20 30 st
20 0 st
085429 CRS0000 BOB                      V  0001 P  0007 D  0011
```

B

```
dummy
0@20 0 st
quit
085522 CRS0003 REQUEST IGNORED ENTER NEW DEMAND
dummy
0 0 st
20 0 st
085550 CRS0000 DUMMY                    V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
085613 CRS0000 ARNIE                    V  0001 P  0003 D  0007
bob
30 30 st
20 0 st
085629 CRS0000 BOB                      V  0001 P  0007 D  0011
```

```
dummt#y
0 0 st
20 0 st
085730 CRS0000 DUMMY                    V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
085753 CRS0000 ARNIE                    V  0001 P  0004 D  0008
bob
40 30 st
20 0 st
085842 CRS0000 BOB                      V  0001 P  0007 D  0011
```

C

```
dummy
0 0 st
20 0 st
085948 CRS0000 DUMMY                 V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
090013 CRS0000 ARNIE                 V  0001 P  0003 D  0007
bob
40 30 st
20 0 st
090025 CRS0000 BOB                   V  0001 P  0007 D  0011
```

1.2.2-11

D

```
dummy
0 0 st
20 0 st
090137 CRS0000 DUMMY                 V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
090154 CRS0000 ARNIE                 V  0001 P  0003 D  0007
bob
50 30 st
20 0 st
090210 CRS0000 BOB                   V  0001 P  0007 D  0012
```

F

```
dummy
0 0 st
20 0 st
090312 CRS0000 DUMMY                 V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
090338 CRS0000 ARNIE                 V  0001 P  0003 D  0007
bob
60 30 st
20 0 st
090351 CRS0000 BOB                   V  0001 P  0008 D  0013
```

F

```
dummy
0 0 st
20 0 st
090456 CRS0000 DUMMY                V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
090522 CRS0000 ARNIE                V  0001 P  0003 D  0007
bob
70 30 st
20 0 st
090534 CRS0000 BOB                  V  0001 P  0008 D  0013
```

G

```
dummy
0 0 st
20 0 st
090630 CRS0000 DUMMY                V  0001 P  0001 D  0005
arnie
40 0 st
20 0 st
090641 CRS0000 ARNIE                V  0001 P  0003 D  0007
bob
80 30 st
20 0 st
090657 CRS0000 BOB                  V  0001 P  0008 D  0014
```

1.2.2-11

h

```
dummy
0 0 st
20 0 st
090750 CRS0000 DUMMY                V  0001 P  0001 D  0005
vehi1@arnie
40 0 st
20 0 st
090807 CRS0000 ARNIE                V  0001 P  0003 D  0007
bob
40 20 st
20 0 st
090818 CRS0000 BOB                  V  0001 P  0005 D  0008
```

```
   dummy
   0 0 st
   20 0 st
   090911 CRS0000 DUMMY                V   0001 P   0001 D   0005
   arnie
   40 0 st
   20 0 st
I  090924 CRS0000 ARNIE                V   0001 P   0003 D   0007
   bob
   70 20 st
   20 0 st
   090937 CRS0000 BOB                  V   0001 P   0008 D   0013



   dummy
   0 0 st
   20 0 st
J  091031 CRS0000 DUMMY                V   0001 P   0001 D   0005
   arnie
   40 0 st
   20 0 st
   091047 CRS0000 ARNIE                V   0001 P   0003 D   0007
   bob
   10 10 st
   20 0 st
   091059 CRS0000 BOB                  V   0001 P   0003 D   0006

    pass

    pass
    dummy
    0 0 st
    20 0 st
    101352 CRS0000 DUMMY                V   0001 P   0001 D   0004
    arnie
K   40 0 st
    20 0 st
    101419 CRS0000 ARNIE                V   0001 P   0003 D   0007
    bob
    20 10 st
    20 0 st
    101436 CRS0000 BOB                  V   0001 P   0002 D   0005
```

```
     dummy
     0 0 st
     20 0 st
     101532 CRS0000 DUMMY                   V  0001 P  0001 D  0005
     arnie
     40 0 st
L    20 0 st
     101548 CRS0000 ARNIE                   V  0001 P  0003 D  0007
     bob
     70 10 st
     20 0 st
     101603 CRS0000 BOB                     V  0001 P  0008 D  0013
```

```
     dummy
     0 0 st
     20 0 st
     101702 CRS0000 DUMMY                   V  0001 P  0001 D  0005
     arnie
m    40 0 st
     20 0 st
     101715 CRS0000 ARNIE                   V  0001 P  0003 D  0007
     bob
     80 10 st
     20 0 st
     101734 CRS0000 BOB                     V  0001 P  0008 D  0014
```

```
     dummy
     0 0 st
     20 0 st
n    101831 CRS0000 DUMMY                   V  0001 P  0001 D  0005
     arnie
     40 0 st
     20 0 st
     101849 CRS0000 ARNIE                   V  0001 P  0003 D  0007
     bob
n    90 10 st
     20 0 st
     101906 CRS0000 BOB                     V  0001 P  0009 D  0015
```

1.2.2-11

A

```
      LOCA001 0 0 ST
035328 CRS0150  VEH0001 AT 0 0 ST
[CARS:
035351 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
[CARS:VEHI1
085406 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
085438 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
085447 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
085458 CRS0105 VEH 0001 P  BOB                   20 30 ST
[CARS:VEHI1
085508 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
085521 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:LOC
085543 CRS0120      INVALID        B
[CARS:
085550 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
[CARS:VEHI1
085603 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
085632 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
085641 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
085650 CRS0105 VEH 0001 P  3OB                   30 30 ST
[CARS:VEHI1
085658 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
085709 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-11 C

```
085739 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
[CARS:VEHI1
085821 CRS0110 VEH 0001 D  DUMMY    ?            20 0 ST
[CARS:VEHI1
085850 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
085901 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
085913 CRS0105 VEH 0001 P  BOB                   40 30 ST
[CARS:VEHI1
085922 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
085939 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
085948 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
[CARS:VEHI1
090000 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
090030 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
090040 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
090054 CRS0105 VEH 0001 P  BOB                   40 30 ST
[CARS:VEHI1
090104 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
090128 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-11 D

```
090137 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
[CARS:VEHI1
090152 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
090212 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
090222 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
090231 CRS0105 VEH 0001 P  BOB                   50 30 ST
[CARS:VEHI1
090242 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
090303 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

E

```
      VEHI1
090312 CRS0105 VEH 0001 P  DUMMY                0 0 ST
090325 CRS0110 VEH 0001 D  DUMMY                20 0 ST
[CARS:VEHI1
090401 CRS0105 VEH 0001 P  ARNIE                40 0 ST
[CARS:VEHI1
090411 CRS0110 VEH 0001 D  ARNIE                20 0 ST
[CARS:VEHI1
090420 CRS0105 VEH 0001 P  BOB                  60 30 ST
[CARS:VEHI1
090430 CRS0110 VEH 0001 D  BOB                  20 0 ST
[CARS:VEHI1
090440 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-11 F

```
      VEHI1
090456 CRS0105 VEH 0001 P  DUMMY                0 0 ST
090512 CRS0110 VEH 0001 D  DUMMY                20 0 ST
[CARS:VEHI1
090537 CRS0105 VEH 0001 P  ARNIE                40 0 ST
[CARS:VEHI1
090555 CRS0110 VEH 0001 D  ARNIE                20 0 ST
[CARS:VEHI1
090605 CRS0105 VEH 0001 P  BOB                  70 30 ST
[CARS:VEHI1
090614 CRS0110 VEH 0001 D  BOB                  20 0 ST
[CARS:VEHI1
090624 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

G

```
      VEHI1
090630 CRS0105 VEH 0001 P  DUMMY                0 0 ST
090633 CRS0110 VEH 0001 D  DUMMY                20 0 ST
[CARS:VEHI1
090705 CRS0105 VEH 0001 P  ARNIE                40 0 ST
[CARS:VEHI1
090714 CRS0110 VEH 0001 D  ARNIE                20 0 ST
[CARS:VEHI1
090724 CRS0105 VEH 0001 P  BOB                  80 30 ST
[CARS:VEHI1
090733 CRS0110 VEH 0001 D  BOB                  20 0 ST
[CARS:VEHI1
090744 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

H

```
      VEHI1
090750 CRSO105 VEH 0001 P  DUMMY                       0  0 ST
090753 CRSO110 VEH 0001 D  DUMMY                      20  0 ST
[CARS:VEHI1
090822 CRSO105 VEH 0001 P  ARNIE                      40  0 ST
[CARS:VEHI1
090832 CRSO105 VEH 0001 P  BOB                        40 20 ST
[CARS:VEHI1
090844 CRSO110 VEH 0001 D  BOB                        20  0 ST
[CARS:VEHI1
090854 CRSO110 VEH 0001 D  ARNIE                      20  0 ST
[CARS:VEHI1
090905 CRSO115 VEH 0001 NOW UNASSIGNED
[CARS:
```

I

```
      VEHI1
090911 CRSO105 VEH 0001 P  DUMMY                       0  0 ST
090913 CRSO110 VEH 0001 D  DUMMY                      20  0 ST
[CARS:VEHI1
090942 CRSO105 VEH 0001 P  ARNIE                      40  0 ST
[CARS:VEHI1
090951 CRSO110 VEH 0001 D  ARNIE                      20  0 ST
[CARS:VEG#HI1
091005 CRSO105 VEH 0001 P  BOB                        70 20 ST
[CARS:VEHI1
091015 CRSO110 VEH 0001 D  BOB                        20  0 ST
[CARS:VEHI1
091025 CRSO115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI1
```

J

```
091031 CRSO105 VEH 0001 P  DUMMY                       0  0 ST
091038 CRSO110 VEH 0001 D  DUMMY                      20  0 ST
[CARS:VEHI1
091102 CRSO105 VEH 0001 P  BOB                        10 10 ST
[CARS:VEHI1
091112 CRSO110 VEH 0001 D  BOB                        20  0 ST
[CARS:VEHI1
091122 CRSO105 VEH 0001 P  ARNIE                      40  0 ST
[CARS:VEHI1
091131 CRSO110 VEH 0001 D  ARNIE                      20  0 ST
V[CAR":VEHI1
091142 CRSO115 VEH 0001 NOW UNASSIGNED
[CARS:
     [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
```

I.12-11

K

```
     [[[[[[[[[[[[[[[[CARS:VEHI1[CARS:
[CARS:HOLD2
101314 CRS0330 EXPECTED AT 0000 AT
[CARS:LOCA
101345 CRS0120      INVALID
[CARS:VEHI1
101352 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
101401 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:
[CARS:VEHI1
101445 CRS0105 VEH 0001 P  BOB                   20 10 ST
[CARS:VEHI1
101456 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
101505 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
101515 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
101525 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

L

```
       VEHI1
101532 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
101539 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
101606 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
101619 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
101628 CRS0105 VEH 0001 P  BOB                   70 10 ST
[CARS:VEHI1
101640 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
101653 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

M

```
      VEHI1
101701 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
101705 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
101735 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
101752 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
101801 CRS0105 VEH 0001 P  BOB                   80 10 ST
[CARS:VEHI1
101812 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
101824 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

N

```
      VEHI1
101831 CRS0105 VEH 0001 P  DUMMY                 0 0 ST
101837 CRS0110 VEH 0001 D  DUMMY                 20 0 ST
[CARS:VEHI1
101909 CRS0105 VEH 0001 P  ARNIE                 40 0 ST
[CARS:VEHI1
101921 CRS0110 VEH 0001 D  ARNIE                 20 0 ST
[CARS:VEHI1
101932 CRS0105 VEH 0001 P  BOB                   90 10 ST
[CARS:VEHI1
101943 CRS0110 VEH 0001 D  BOB                   20 0 ST
[CARS:VEHI1
101954 CRS0115 VEH 0001 NOW UNASSIGNED
```

I.2.2-12

```
arnie
70 50 dy##st
50 50 st
102058 CRS0000 ARNIE                    V  0001 P  0001 D  0005
bob
50 90 st
50 50 st
102123 CRS0000 BOB                      V  0001 P  0005 D  0010
charlie
30 50 st
50 50 st
102139 CRS0000 CHARLIE                  V  0001 P  0004 D  0007
dan
50 10 st
50 50 st
102200 CRS0000 DAN                      V  0001 P  0013 D  0017
```

I.2.2-12

```
[
 CARS:LOCA000150 50 ST
102025 CRS0150  VEH0001 AT 50 50 ST
[CARS:
102057 CRS0105 VEH 0001 P  ARNIE                  70 50 ST
[CARS:VEHI1
102208 CRS0110 VEH 0001 D  ARNIE                  50 50 ST
[CARS:VEHI1
102220 CRS0105 VEH 0001 P  CHARLIE                30 50 ST
[CARS:VEHI1
102232 CRS0110 VEH 0001 D  CHARLIE                50 50 ST
[CARS:VEHI1
102244 CRS0105 VEH 0001 P  BOB                    50 90 ST
[CARS:VEHI1
102256 CRS0110 VEH 0001 D  BOB                    50 50 ST
[CARS:VEHI1
102307 CRS0105 VEH 0001 P  DAN                    50 10 ST
[CARS:VEHI1
102326 CRS0110 VEH 0001 D  DAN                    50 50 ST
[CARS:VEHI1
102338 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2 - 15

A

```
arnie
50 50 st
50 100 st
102534 CRS0000 ARNIE                    V   0002 P   0003 D   0008
bob
60 50 st
50 100 st
102553 CRS0000 BOB                      V   0002 P   0004 D   0009
charlie
70 50 st
50 0 st
102607 CRS0000 CHARLIE                  V   0001 P   0004 D   0009
dan
60 60 st
50 0 st
102622 CRS0000 DAN                      V   0001 P   0005 D   0011
ed
50 60 st
50 0 st
102636 CRS0000 ED                       V   0001 P   0006 D   0011
frank
40 60 st
50 100 st
102650 CRS0000 FRANK                    V   0002 P   0004 D   0009
george
50 40 st
50 100 st
102706 CRS0000 GEORGE                   V   0002 P   0004 D   0011
```

B

```
arnie
50 50 st
0
100 100 st
103050 CRS0000 ARNIE                    V   0002 P   0003 D   0009
bob
60 50 st
100 100 st
103108 CRS0000 BOB                      V   0002 P   0004 D   0009
charlie
70 50 st
0 100 st
103123 CRS0000 CHARLIE                  V   0001 P   0004 D   0011
dan
60 30 st
0 100 st
103138 CRS0000 DAN                      V   0001 P   0005 D   0011
```

```
ed
50 60 st
0 100 st
103202 CRS0000 ED                        V  0001 P  0006 D  0011
frank
40 60 st
100 100 st
103220 CRS0000 FRANK                     V  0002 P  0003 D  0011
george
50 40 st
100 100 st
103240 CRS0000 GEORGE                    V  0002 P  0004 D  0012
```

1.2.2-13 A

```
     LOCA1    0 50 ST
102418 CRS0010  0 50 ST            NOT IN SERVICE AREA
102418 CRS0155  VEH0001 NOTMOVE
[CARS:LOCA00010 50 ST
102449 CRS0150  VEH0001 AT 0 50 ST
[CARS:RST02
102459 CRS0240 ENTER VEHICLE LOCATION
[CARS:100 50 ST
102512 CRS0246 VEHICLE 0002 RESTORED
[CARS:
102534 CRS0105 VEH 0002 P  ARNIE                  50 50 ST
[CARS:
102607 CRS0105 VEH 0001 P  CHARLIE                70 50 ST
[CARS:VEHI1
102708 CRS0105 VEH 0001 P  DAN                    60 60 ST
[CARS:VEHI1
102718 CRS0105 VEH 0001 P  ED                     50 60 ST
[CARS:VEHI1
102729 CRS0110 VEH 0001 D  ED                     50 0 ST
[CARS:VEHI1
102740 CRS0110 VEH 0001 D  DAN                    50 0 ST
[CARS:VEHI1
102751 CRS0110 VEH 0001 D  CHARLIE                50 0 ST
[CARS:VEHI1
102804 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
102814 CRS0105 VEH 0002 P  BOB                    60 50 ST
[CARS:VEHI2
102825 CRS0105 VEH 0002 P  GEORGE                 50 40 ST
[CARS:VEHI2
102836 CRS0105 VEH 0002 P  FRANK                  40 60 ST
[CARS:VEHI2
102848 CRS0110 VEH 0002 D  FRANK                  50 100 ST
[CARS:VEHI2
102900 CRS0110 VEH 0002 D  ARNIE                  50 100 ST
```

```
[CARS:VEHI2
102911 CRS0110 VEH 0002 D  BOB                   50 100 ST
V[CARS:REPE2
102947 CRS0110 VEH 0002 D  BOB                   50 100 ST
[CARS:VEHI2
102959 CRS0110 VEH 0002 D  GEORGE                50 100 ST
[CARS:VEHI2
103011 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

M2,2-13 B

```
      LOCA00010 50 ST
 103030 CRS0150  VEH0001 AT 0 50 ST
 [CARS:LOCA0002100 50 ST
 103044 CRS0150  VEH0002 AT 100 50 ST
 [CARS:
 103050 CRS0105 VEH 0002 P  ARNIE                 50 50 ST
 [CARS:
 103123 CRS0105 VEH 0001 P  CHARLIE               70 50 ST
 [CARS:VEHI ALL
 103159 CRS0120  ALL INVALID
 [CARS:VEHI1
 103254 CRS0105 VEH 0001 P  DAN                   60 60 ST
 [CARS:VEHI1
 103304 CRS0105 VEH 0001 P  ED                    50 60 ST
 [CARS:VEHI1
 103314 CRS0110 VEH 0001 D  ED                    0 100 ST
 [CARS:VEHI1
 103324 CRS0110 VEH 0001 D  DAN                   0 100 ST
 [CARS:VEHI1
 103335 CRS0110 VEH 0001 D  CHARLIE               0 100 ST
 [CARS:VEHI1
 103345 CRS0115 VEH 0001 NOW UNASSIGNED
 [CARS:VEHI2
 103354 CRS0105 VEH 0002 P  FRANK                 40 60 ST
 [CARS:VEHI2
 103405 CRS0105 VEH 0002 P  GEORGE                50 40 ST
 [CARS:VEHI2
 103415 CRS0105 VEH 0002 P  BOB                   60 50 ST
 [CARS:VEHI2
 103425 CRS0110 VEH 0002 D  BOB                   100 100 ST
 [CARS:VEHI2
 103436 CRS0110 VEH 0002 D  ARNIE                 100 100 ST
 [CARS:VEHI2
 103446 CRS0110 VEH 0002 D  FRANK                 100 100 ST
 [CARS:VEHI2
 103457 CRS0110 VEH 0002 D  GEORGE                100 100 ST
 [CARS:VEHI2
 103508 CRS0115 VEH 0002 NOW UNASSIGNED
 [CARS:
```

1.2.2-14

```
dummy
0 10 st
0 0 st
103543 CRS0000 DUMMY                        V  0001 P  0005 D  0008
arnie
60 0 st
60 40 st
103615 CRS0000 ARNIE                        V  0001 P  0005 D  0009
bob
40 0 st
20 0 st
103630 CRS0000 BOB                          V  0001 P  0004 D  0007
```

I.2.2-14

```
    HOLD2
103522 CRS0330 EXPECTED AT 0000 AT
[CARS:VEHI1
103543 CRS0105 VEH 0001 P  DUMMY                   0 10 ST
103601 CRS0110 VEH 0001 D  DUMMY                   0 0 ST
[CARS:VEHI1
103636 CRS0105 VEH 0001 P  BOB                     40 0 ST
[CARS:VEHI1
103648 CRS0110 VEH 0001 D  BOB                     20 0 ST
[CARS:VEJ#HI1
103702 CRS0105 VEH 0001 P  ARNIE                   60 0 ST
[CARS:VEHI1
103733 CRS0110 VEH 0001 D  ARNIE                   60 40 ST
[CARS:VEHI1
103748 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.2.2-15

```
arnie
50 50 st
10 0 st
104037 CRS0000 ARNIE                V  0002 P  0001 D  0006
bob
10 10 st
50 50 st
104052 CRS0000 BOB                  V  0001 P  0003 D  0009
charlie
100 90 st
50 50 st
104110 CRS0000 CHARLIE              V  0001 P  0010 D  0016
dan
505@50 50 st
70 90 st
104126 CRS0000 DAN                  V  0001 P  0007 D  0011
```

v1

```
ed
50 50 st
90 100 st
104141 CRS0000 ED                   V  0001 P  0007 D  0013
frank
0 10 st
50 50 st
104204 CRS0000 FRANK                V  0002 P  0006 D  0012
george
100 100 st
90 90 st
104218 CRS0000 GEORGE               V  0001 P  0012 D  0016
hank
0 0 st
50 50 st
104231 CRS0000 HANK                 V  0002 P  0006 D  0013
```

```
    dummy1
    40 50 st
    50 50 st
    104540 CRS0000 DUMMY1               V  0001 P  0002 D  0005
    dummy #2
    60 50 st
    50 50 st
    104558 CRS0000 DUMMY2               V  0002 P  0001 D  0003
    arnie
    50 50 st
B   10 0 st
    104650 CRS0000 ARNIE                V  0001 P  0002 D  0007
    bob
    10 10 st
    50 50 st
    104703 CRS0000 BOB                  V  0001 P  0006 D  0012
    charlie
    100 90 st
    50 50 st
    104717 CRS0000 CHARLIE              V  0002 P  0005 D  0010
    dan
    50 50 st
    70 90 st
    104730 CRS0000 DAN                  V  0002 P  0002 D  0006
    ed
    50 50 st
    90 100 st
    104742 CRS0000 ED                   V  0002 P  0002 D  0008
    frank


    0 10 st
    50 50 st
    104754 CRS0000 FRANK                V  0001 P  0006 D  0013
    george
    100 1000 st@100 100 st
    90 90 st
    104830 CRS0000 GEORGE               V  0002 P  0007 D  0011
B   hank
    0 0 st
    50 50 st
    104845 CRS0000 HANK                 V  0001 P  0006 D  0015
```

I.2.2-15a

```
    RST02
103828 CRS0240 ENTER VEHICLE LOCATION
[CARS:50 50 ST
103907 CRS0246 VEHICLE 0002 RESTORED
[CARS:LOCA000150 50 ST
103959 CRS0150  VEH0001 AT 50 50 ST
[CARS:
104037 CRS0105 VEH 0002 P  ARNIE                 50 50 ST
104052 CRS0105 VEH 0001 P  BOB                   10 10 ST
[CARS:VEHI1
104233 CRS0110 VEH 0001 D  BOB                   50 50 ST
[CARS:VEHI1
104243 CRS0105 VEH 0001 P  DAN                   50 50 ST
[CARS:VEHI1
104252 CRS0105 VEH 0001 P  ED                    50 50 ST
[CARS:VEHI1
104302 CRS0110 VEH 0001 D  DAN                   70 90 ST
[CARS:VEHI1
104312 CRS0110 VEH 0001 D  ED                    90 100 ST
[CARS:VEHI1
104322 CRS0105 VEH 0001 P  GEORGE                100 100 ST
[CARS:VEHI1
104334 CRS0105 VEH 0001 P  CHARLIE               100 90 ST
[CARS:VEHI1
104344 CRS0110 VEH 0001 D  GEORGE                90 90 ST
[CARS:VEHI1
104354 CRS0110 VEH 0001 D  CHARLIE               50 50 ST
[CARS:VEHI2
104403 CRS0110 VEH 0002 D  ARNIE                 10 0 ST
[CARS:VEHI2
104414 CRS0105 VEH 0002 P  HANK                  0 0 ST
[CARS:VEHI2
104425 CRS0105 VEH 0002 P  FRANK                 0 10 ST
[CARS:VEHI2
104435 CRS0110 VEH 0002 D  FRANK                 50 50 ST
[CARS:VEHI2
104445 CRS0110 VEH 0002 D  HANK                  50 50 ST
[CARS:VEHI2
104455 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

I.2.2-15
B

1.2-2-15 B

```
     LOCA001 5#40 50
104512 CRS0150  VEH0001 AT 40 50 ST
[CARS:LOCA002 60 40 ###50 ST
104527 CRS0150  VEH0002 AT 60 50 ST
[CARS:
[CARS:
104557 CRS0105 VEH 0002 P  DUMMY2                  60 50 ST
[CARS:VEHI1
104613 CRS0105 VEH 0001 P  DUMMY1                  40 50 ST
[CARS:VEHI1
104622 CRS0110 VEH 0001 D  DUMMY1                  50 50 ST
[CARS:VEHI2
104631 CRS0110 VEH 0002 D  DUMMY2                  50 50 ST
[CARS:VEHI1
104846 CRS0105 VEH 0001 P  ARNIE                   50 50 ST
[CARS:VEHI1
104859 CRS0110 VEH 0001 D  ARNIE                   10 0 ST
[CARS:VEHI1
104909 CRS0105 VEH 0001 P  HANK                    0 0 ST
[CARS:VEHI1
104918 CRS0105 VEH 0001 P  FRANK                   0 10 ST
[CARS:VEHI1
104927 CRS0105 VEH 0001 P  BOB                     10 10 ST
[CARS:VEHI1
104936 CRS0110 VEH 0001 D  BOB                     50 50 ST
[CARS:VEHI1
104946 CRS0110 VEH 0001 D  FRANK                   50 50 ST
[CARS:VEHI1
105000 CRS0110 VEH 0001 D  HANK                    50 50 ST
[CARS:VEHI1
105010 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
105017 CRS0105 VEH 0002 P  DAN                     50 50 ST
[CARS:VEHI2
105026 CRS0105 VEH 0002 P  ED                      50 50 ST
[CARS:VEHI2
105038 CRS0110 VEH 0002 D  DAN                     70 90 ST
[CARS:VEHI2
105046 CRS0110 VEH 0002 D  ED                      90 100 ST
[CARS:VEHI2
105056 CRS0105 VEH 0002 P  GEORGE                  100 100 ST
[CARS:VEHI2
105106 CRS0105 VEH 0002 P  CHARLIE                 100 90 ST
[CARS:VEHI2
105115 CRS0110 VEH 0002 D  GEORGE                  90 90 ST
[CARS:VEHI2
105125 CRS0110 VEH 0002 D  CHARLIE                 50 50 ST
[CARS:VEHI2
105135 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

I.2.3A

```
closio punch on
R; T=0.01/0.07 16.08.17

cp log x
 SHIFT CONNECTTOTAL  ;"   1   0:07:31   "LOGOUT AT 16.12.05 ON 06/21/71

cp/67 version 2.0-33 03/26/71

1@d cars10
 .. connected ..
pass

arnie
20 putnam av
200 vassar st
161549 CRS0000 ARNIE                V  0002 P  0003 D  0011
bob
cars
77 mass av
161615 CRS0000 BOB                  V  0001 P  0001 D  0006
dan
77 mass av
post office
161640 CRS0000 DAN                  V  0001 P  0005 D  0012
charlie
100 plympton st
705 memorial dr
161719 CRS0000 CHARLIE              V  0002 P  0003 D  0011
ed
425 mass av
550 green st
161753 CRS0000 ED                   V  0001 P  0006 D  0012
george
300 western av
200 vassar st
161920 CRS0000 GEORGE               V  0002 P  0004 D  0015
frank
central sq
hr@harvard sq
162050 CRS0000 FRANK                V  0001 P  0004 D  0012
harry
200 allston st
77 mass av
162239 CRS0000 HARRY                V  0002 P  0007 D  0015
ingrid
77 mass av
```

```
cars
162648 CRS0000 INGRID                V  0002 P  0012 D  0017
judy
harvard sq
1045 mass av
162951 CRS0000 JUDY                  V  0001 P  0004 D  0009
kathy
city hall
20 lopez st
163249 CRS0000 KATHY                 V  0001 P  0007 D  0012
olivia
morse school
77 mass av
163747 CRS0000 OLIVIA                V  0001 P  0011 D  0018
linda
cars
joyce chen
163935 CRS0000 LINDA                 V  0002 P  0002 D  0010
martha
cars
harvard sq
164048 CRS0000 MARTHA                V  0002 P  0011 D  0025
nora
705 memorial dr
harvard sq
164216 CRS0000 NORA                  V  0002 P  0019 D  0028
paula
77 mass av
city hall
164952 CRS0000 PAULA                 V  0001 P  0013 D  0020
quentin
harvard sq
central sq
170052 CRS0000 QUENTIN               V  0002 P  0002 D  0010
rachel
harvard sq
mit
170117 CRS0000 RACHEL                V  0002 P  0003 D  0015
susan
mit
705 memorial dr
170215 CRS0000 SUSAN                 V  0002 P  0013 D  0022
tricia
morse school
cars
170247 CRS0000 TRICIA                V  0001 P  0009 D  0019
       @
@
```

12.5A

I.2.7A

```
d cars10
 .. connected ..
vehi

161548 CRS0105 VEH 0002 P  ARNIE                    20 PUTNAM AV

161615 CRS0105 VEH 0001 P  BOB                      CARS
vehi1
161643 CRS0110 VEH 0001 D  BOB                      77 MASS AV
vehi2
161751 CRS0105 VEH 0002 P  CHARLIE                  100 PLYMPTON ST
vehi1
161848 CRS0105 VEH 0001 P  DAN                      77 MASS AV
vehi1
161856 CRS0105 VEH 0001 P  ED                       425 MASS AV
vehi2
162018 CRS0105 VEH 0002 P  GEORGE                   300 WESTERN AV
vehi1
162153 CRS0105 VEH 0001 P  FRANK                    CENTRAL SQ
vehi1
162449 CRS0110 VEH 0001 D  DAN                      POST OFFICE
vehi2
162548 CRS0110 VEH 0002 D  CHARLIE                  705 MEMORIAL DR
vehi1
162617 CRS0110 VEH 0001 D  ED                       550 GREEN ST
vehi1
162839 CRS0110 VEH 0001 D  FRANK                    HARVARD SO
vehi2
162848 CRS0105 VEH 0002 P  HARRY                    200 ALLSTON ST
vehi2
163150 CRS0110 VEH 0002 D  ARNIE                    200 VASSAR ST
vehi2
163517 CRS0110 VEH 0002 D  GEORGE                   200 VASSAR ST
vehi2
163527 CRS0110 VEH 0002 D  HARRY                    77 MASS AV
vehi1
163619 CRS0105 VEH 0001 P  JUDY                     HARVARD SO
vehi1
163630 CRS0110 VEH 0001 D  JUDY                     1045 MASS AV
vehi2
163717 CRS0105 VEH 0002 P  INGRID                   77 MASS AV
```

```
vehi2
163745 CRS0110 VEH 0002 D  INGRID                 CARS
vehi2
164015 CRS0105 VEH 0002 P  LINDA                  CARS
vehi2
164024 CRS0110 VEH 0002 D  LINDA                  JOYCE CHEN
vehi1
@vh@vehi1
164259 CRS0105 VEH 0001 P  KATHY                  CITY HALL
vehi2
164327 CRS0105 VEH 0002 P  MARTHA                 CARS
vehi2
164657 CRS0105 VEH 0002 P  NORA                   705 MEMORIAL DR
vehi2
164948 CRS0110 VEH 0002 D  MARTHA                 HARVARD SQ
vehi1
164958 CRS0110 VEH 0001 D  KATHY    12.3A         20 LOPEZ ST
vehi1
165323 CRS0105 VEH 0001 P  OLIVIA                 MORSE SCHOOL
vehi1
165448 CRS0110 VEH 0001 D  OLIVIA                 77 MASS AV
vehi1
170035 CRS0105 VEH 0001 P  PAULA                  77 MASS AV
vehi1
170043 CRS0110 VEH 0001 D  PAULA                  CITY HALL
vehi2
170100 CRS0170 VEH 0002 5 MINS OVERDUE HARVARD SQ
0316 CRS0110 VEH10002 D  NORA                   HARVARD SQ
vehi2
170331 CRS0105 VEH 0002 P  QUENTIN                HARVARD SQ
vehi2
170341 CRS0105 VEH 0002 P  RACHEL                 HARVARD SQ
vehi2
170349 CRS0110 VEH 0002 D  QUENTIN                CENTRAL SQ
vehi1
170546 CRS0105 VEH 0001 P  TRICIA                 MORSE SCHOOL
vehi1 @vehi1
171116 CRS0110 VEH 0001 D  TRICIA                 CARS
vehi1
171546 CRS0170 VEH 0002 5 MINS OVERDUE CENTRAL SQ
1547 CRS0115 VEH 0001 NOW UNASSIGNED
vehi2
171603 CRS0110 VEH 0002 D  RACHEL                 MIT
vehi2
171946 CRS0105 VEH 0002 P  SUSAN                  MIT
vehi2
171956 CRS0110 VEH 0002 D  SUSAN                  705 MEMORIAL DR
vehi2
172354 CRS0115 VEH 0002 NOW UNASSIGNED
```

1,2,3 b

A

```
 ar@arnie
10 60 st
90 60 st
094340 CRS0000 ARNIE                V  0001 P  0002 D  0008
bob
40 80 st
60 80 st
094352 CRS0000 BOB                  V  0001 P  0004 D  0008
```

B

```
arnie
10 60 st
90 60 st
094530 CRS0000 ARNIE                V  0001 P  0002 D  0008
bob
40 100@40 90 st
60 0#90 st
094554 CRS0000 BOB                  V  0002 P  0003 D  0007
```

C

```
arnie
094616 CRS0008 NAME ALREADY KNOWN TO SYSTEM - TRY AGAIN
arnie
10 60 st
90 60 st
094711 CRS0000 ARNIE                V  0001 P  0002 D  0008
bob
40 100 st
60 100 st
094723 CRS0000 BOB                  V  0002 P  0004 D  0007
```

D

```
arnie
094748 CRS0008 NAME ALREADY KNOWN TO SYSTEM - TRY AGAIN
arnie
10 60 st
90 60 st
094858 CRS0000 ARNIE                V  0001 P  0003 D  0010
bob
40 80 st
60 80 st
094915 CRS0000 BOB                  V  0002 P  0003 D  0006
```

I.2.3B

A

```
      LOCA1    10 30 ST
094318 CRS0150  VEH0001 AT 10 30 ST
[CARS:LOCA2    40 30 ST
094331 CRS0150  VEH0002 AT 40 30 ST
[CARS:
094340 CRS0105 VEH 0001 P  ARNIE                    10 60 ST
[CARS:
[CARS:VEHI1
094404 CRS0105 VEH 0001 P  BOB                      40 80 ST
[CARS:VEHI1
094413 CRS0110 VEH 0001 D  BOB                      60 80 ST
[CARS:VEHI1
094423 CRS0110 VEH 0001 D  ARNIE                    90 60 ST
[CARS:VEHI1
094434 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

B

```
      LOCA1    10 30 ST
094513 CRS0150  VEH0001 AT 10 30 ST
[CARS:
094530 CRS0105 VEH 0001 P  ARNIE                    10 60 ST
[CARS:VEHI1@
094554 CRS0105 VEH 0002 P  BOB                      40 90 ST
[CARS:VEHI1
094615 CRS0110 VEH 0001 D  ARNIE                    90 60 ST
[CARS:VEHI1
094625 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
094632 CRS0110 VEH 0002 D  BOB                      60 90 ST
[CARS:VEHI2
094643 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

1.2.3b

c

```
      LOCA1    10 30 ST
094655 CRS0150  VEH0001 AT 10 30 ST
[CARS:LOCA2    40 30 ST
094707 CRS0150  VEH0002 AT 40 30 ST
[CARS:
094711 CRS0105 VEH 0001 P  ARNIE                      10 60 ST
094723 CRS0105 VEH 0002 P  BOB                        40 100 ST
[CARS:VEHI1
094745 CRS0110 VEH 0001 D  ARNIE                      90 60 ST
[C RS:VEHI1
094755 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
094803 CRS0110 VEH 0002 D  BOB                        60 100 ST
[CARS:VEHI2
094812 CRS0115 VEH 0002 NOW UNASSIGNED — D
[CARS:LOCA1    10 0 ST
094829 CRS0150  VEH0001 AT 10 0 ST
[CARS:LOCA2    90 80 ST
094851 CRS0150  VEH0002 AT 90 80 ST
[CARS:
094857 CRS0105 VEH 0001 P  ARNIE                      10 60 ST
094915 CRS0105 VEH 0002 P  BOB                        40 80 ST
[CARS:VEHI1
094936 CRS0110 VEH 0001 D  ARNIE                      90 60 ST
[CARS:VEHI1
094952 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
094959 CRS0110 VEH 0002 D  BOB                        60 80 ST
[CARS:VEHI2
095009 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

1,2,4

```
pas
BTM0020 INVALID CONSOLE TYPE - TRY AGAIN
pass                                                          0

0005first
kendall sq
harvard sq
113444 CRS0000 FIRST                     V  0014 P  0001 D  0013
005 second
kendall sq
harvard sq
113503 CRS0000 SECOND                    V  0003 P  0001 D  0013
0009third
113547 CRS0006 0008 IS THE MAXIMUM VEHICLE CAPACITY - TRY AGAIN
```

1,2,4

```
[[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
113444 CRS0105 VEH 0014 P  FIRST                KENDALL SQ   0005
113503 CRS0105 VEH 0003 P  SECOND               KENDALL SQ   0005

      ANOM 14 0009
113654 CRS0265  CAN ONLY ACCOMODATE0003 OF 0009 FOR     14
[CARS:9
113717 CRS0265  CAN ONLY ACCOMODATE0003 OF 9    FOR     14
[CARS:8
113753 CRS0255 8     AT NEXT STOP FOR   14
[CARS:
```

1.2.6-2 PASS

```
pass
acct1020365 prir0002ralph nader
harvard sq
city hall
135043 CRS0000 RALPH NADER         V  0002 P  0005 D  0011
acct1234567 mr. phoney
135058 CRS0007 INVALID ACCOUNT NUMBER -TRY AGAIN
acct1030365 0003raiders
135114 CRS0007 INVALID ACCOUNT NUMBER -TRY AGAIN
acct1020365 0003raiders
harvard sq
city hall
135131 CRS0000 RAIDERS             V  0002 P  0004 D  0011
cnclsra1
135143 CRS0290 SRA1                NOT FOUND
cnclsra1
135441 CRS0275 SRA1                 TIME  0003  V 0003    1 FRONT ST
yes
135449 CRS0300 SRA1                CANCELLED
cnclsra6
135508 CRS0275 SRA6                 TIME  0003  V 0002    29 CROSS ST
cancel
135517 CRS0300 SRA6                CANCELLED
nurse duckett
27 cross st
10 grant st
135611 CRS0000 NURSE DUCKETT       V  0003 P  0004 D  0012
major major
280 franklin st
morse school
135713 CRS0000 MAJOR MAJOR         V  0004 P  0004 D  0019
acct1000124 roger williams
20 ames st
morse school
135830 CRS0000 ROGER WILLIAMS      V  0005 P  0006 D  0013
herman
60 wadsworth st
morse school
140709 CRS0000 HERMAN              V  0005 P  0015 D  0024
prir0002mr. bang
10 erie st
kendall sq@kendall sq
142151 CRS0000 MR. BANG            V  0004 P  0011 D  0030
```

```
IDC Ready-    OVX Nupvi.

1 tscent2
PASSWORD:
[redacted]
14.24.49 ET 06/16/71
ES..VERSION  25A - 05/20/71

offline read first trans#edit card one
TSCENT2  LOGGED IN.
R; T=1.13

DEFAULT TABS SET.
EDIT:
f cold
```

1.2.6-2 PASS

2

```
    romona
    100 memorial dr
    ymca
    150107 CRS0000 ROMONA                 V  0002 P  0007 D  0015
    acct1020036 mrs uhaul
    4 grant st
    post office
    150151 CRS0000 MRS UHAUL              V  0003 P  0008 D  0013
    yossarian
    police dept.
    2 erie st
    150712 CRS0000 YOSSARIAN              V  0003 P  0003 D  0008
    maid 1
    harvard sq
    60 wadsworth st
    151125 CRS0000 MAID 1                 V  0001 P  0001 D  0012
    maid 2
    harvard sq
    10 front st
    151154 CRS0000 MAID 2                 V  0004 P  0002 D  0011
    acct #1020141 maid 3
    harvard sq
    7 lansdowne st
    151237 CRS0000 MAID 3                 V  0002 P  0004 D  0013
    maid 4
    harvard sq
    12 cottage st
    151256 CRS0000 MAID 4                 V  0002 P  0005 D  0012
    maid 5
    harvard sq
    1 hayward st
    151318 CRS0000 MAID 5                 V  0002 P  0004 D  0017
    maid 6
    harvard sq
    sub shop
    151337 CRS0000 MAID 6                 V  0002 P  0004 D  0014
```

```
maid 7
harvard sq
57 allston st
151455 CRS0000 MAID 7                   V  0002 P  0002 D  0011
maid 8
harvard sq
10 decatur st
151538 CRS0000 MAID 8                   V  0005 P  0005 D  0013
maid 9
harvard sq
72 pleasant st
151625 CRS0000 MAID 9                   V  0005 P  0005 D  0012
maid 10
harb@harvard sq
312 pearl st
151700 CRS0000 MAID 10                  V  0005 P  0005 D  0016
miad@maid 11
harvard sq
222 river st
151726 CRS0000 MAID 11                  V  0003 P  0007 D  0013
acct1020253 miad###aid 12
harvard sq
11 valentine st
151753 CRS0000 MAID 12                  V  0005 P  0002 D  0011
maid 13
harvard sq
kendall sq
151810 CRS0000 MAID 13     1.2 ·6-2     V  0005 P  0003 D  0021

mr irigquois
harvard sq
 @3 kinnaird st
152357 CRS0000 MR IRIGQUOIS             V  0003 P  0005 D  0011
mr sou@mr sioux
j@harvard sq
10 green st
152440 CRS0000 MR SIOUX                 V  0003 P  0005 D  0014
```

VEH1

1.2.6-2
JUNE 16

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
135002 CRS0105 VEH 0006 P   SMA1                MIT
135003 CRS0105 VEH 0002 P   SMA2                HARVARD SQ
135004 CRS0105 VEH 0005 P   SMA3                5 WADSWORTH ST
[CARS:
[CARS:VEHI2
1JDARS:CRS0105 VEH 0002 P   RAIDERS             HARVARD SQ    0003

       VEHI2
135206 CRS0105 VEH 0002 P   RALPH NADER         HARVARD SQ
[CARS:VEHI2
135215 CRS0110 VEH 0002 D   RAIDERS             CITY HALL
[CARS:VEHI6
135300 CRS0110 VEH 0006 D   SMA1                MORSE SCHOOL
[CARS:VEHI5
135402 CRS0105 VEH 0003 P   SRA1                1 FRONT ST
135414 CRS0110 VEH 0005 D   SMA3                MORSE SCHOOL
[CARS:
135450 CRS0280  NEXT STOP FOR VEHICLE  0003  CANCELLED.
135451 CRS0105 VEH 0003 P   SRA4                64 STATE ST
[CARS:
[CARS:VEHI2
135542 CRS0110 VEH 0002 D   RALPH NADER         CITY HALL
[CARS:VEHI3
135555 CRS0105 VEH 0003 P   SRA3                10 ALBANY ST
[CARS:VEHI2
135602 CRS0105 VEH 0001 P   SMA5                700 GREEN ST
135604 CRS0105 VEH 0004 P   SRA8                1 CENTRAL SQ
135615 CRS0105 VEH 0002 P   SMA4                2 FRONT ST
[CARS:VEHI6
135647 CRS0105 VEH 0006 P   SRA5                30 GRANITE ST
[CARS:VEHI1
135725 CRS0110 VEH 0001 D   SMA5                MORSE SCHOOL
[CARS:VEHI4
135746 CRS0105 VEH 0004 P   MAJOR MAJOR         280 FRANKLIN ST
[CARS:VEHI3
135804 CRS0105 VEH 0003 P   SRA2                15 AMES ST
[CARS:VEHI5
135817 CRS0115 VEH 0005 NOW UNASSIGNED
[CARS:
135830 CRS0105 VEH 0005 P   ROGER WILLIAMS      20 AMES ST
[CARS:
[CARS:
[CARS:
[CARS:
[CARS:
```

1.2.6-2

```
[CARS:
[CARS:
2[CARS:
[CARS:VEHI1
140608 CRS0105 VEH 0001 P  SRA15                          370 GREEN ST
[CARS:VEHI6
140618 CRS0105 VEH 0006 P  SRA10                          700 MEMORIAL DR
[CARS:VEHI4
140630 CRS0105 VEH 0004 P  SRA9                           30 RIVER ST
[CARS:VEHI3
140641 CRS0105 VEH 0003 P  NURSE DUCKETT                  27 CROSS ST
[CARS:VEHI2
140652 CRS0110 VEH 0002 D  SMA2                           MORSE SCHOOL
[CARS:VEHI5
140702 CRS0105 VEH 0005 P  SMA7                           100 AUBURN ST
[CARS:VEHI2
140723 CRS0110 VEH 0002 D  SMA4                           MORSE SCHOOL
[CARS:VEHI2
140734 CRS0105 VEH 0002 P  SMA8                           10 COTTAGE ST
[CARS:VEHI6
140746 CRS0110 VEH 0006 D  SRA5                           HARVARD SQ
[CARS:VEHI4
140759 CRS0105 VEH 0004 P  SRA12                          70 PUTNAM AV
[CARS:VEHI3
140809 CRS0105 VEH 0003 P  SRA7                           1 FRANKLIN ST
[CARS:VEHI6
140832 CRS0110 VEH 0006 D  SRA10                          HARVARD SQ
[CARS:VEHI6
140842 CRS0115 VEH 0006 NOW UNASSIGNED
[CARS:VEHI4
140850 CRS0105 VEH 0004 P  SMA6                           10 COWPERTHWAITE ST
[CARS:VEHI3
140903 CRS0110 VEH 0003 D  NURSE DUCKETT                  10 GRANT ST
[CARS:VEHI5
140915 CRS0110 VEH 0005 D  SMA7                           MORSE SCHOOL
[CARS:VEHI5
140925 CRS0110 VEH 0005 D  ROGER WILLIAMS                 MORSE SCHOOL
[CARS:VEHI4
140936 CRS0105 VEH 0004 P  SRA14                          4 GRANT ST
[CARS:VEHI4
140948 CRS0110 VEH 0004 D  SRA8                           HARVARD SQ
[CARS:VEHI5
141001 CRS0105 VEH 0005 P  HERMAN                         60 WADSWORTH ST
[CARS:VEHI1
141023 CRS0105 VEH 0001 P  SRA13                          50 RIVER ST
[CARS:VEHI3
141041 CRS0110 VEH 0003 D  SRA2                           HARVARD SQ
[CARS:ANOM005 3
141056 CRS0255 3     AT NEXT STOP FOR  005
[CARS:VEHI5
141058 CRS0105 VEH 0006 P  SMA9                           CENTRAL SQ
141105 CRS0110 VEH 0005 D  HERMAN                         MORSE SCHOOL
[CARS:
```

1.2.6-2

3

```
[CARS:VEHI2
141234 CRS0105 VEH 0002 P  SR2                 20 AUDREY ST
[CARS:VEHI4
141243 CRS0110 VEH 0004 D  MAJOR MAJOR         MORSE SCHOOL
[CARS:VEHI1
141304 CRS0105 VEH 0001 P  SRA11               11 PUTNAM AV
[CARS:VEHI3
141314 CRS0110 VEH 0003 D  SRA4                HARVARD SQ
[CARS:VEHI3
141324 CRS0110 VEH 0003 D  SRA3                HARVARD SQ
[CARS:VEHI6
141334 CRS0110 VEH 0006 D  SMA9                MORSE SCHOOL
[CARS:VEHI3
141344 CRS0110 VEH 0003 D  SRA7                HARVARD SQ
[CARS:VEHI3
141355 CRS0115 VEH 0003 NOW UNASSIGNED
[CARS:BREA5
141407 CRS0130 ENTER LOCATION OF BREAK-DOWN
[CARS:10 PERRY ST
141420 CRS0134 0001 DEMANDS REASSIGNED FOR VEHICLE 0005
[CARS:VEHI4
141517 CRS0110 VEH 0004 D  SMA6                MORSE SCHOOL
[CARS:VEHI4
141527 CRS0115 VEH 0004 NOW UNASSIGNED
[CARS:VEHI2
141534 CRS0105 VEH 0002 P  HERMAN              10 PERRY ST  0003

      VEHI6
141554 CRS0115 VEH 0006 NOW UNASSIGNED
[CARS:
141601 CRS0105 VEH 0006 P  SR4                 35 SIDNEY ST
141607 CRS0105 VEH 0003 P  SR7                 58 ALLSTON ST
[CARS:
[CARS:
[CARS:
[CARS:
[CARS:
[CARS:GIKDFT
141956 CRS0120 FT   INVALID
[CARS:
142029 CRS0170 VEH 0001 5 MINS OVERDUE 11 PUTNAM AV
[CARS:
142103 CRS0105 VEH 0004 P  SR8                 100 MEMORIAL DR
[CARS:
[CARS:HDRWJOGI
142145 CRS0120 JOGI INVALID
[CARS:
[CARS:
[CARS:
```

← crash

1.26-2

4

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
[CARS:VEHI1
150121 CRS0105 VEH 0001 P  0200                LAFAYETTE SQ
[CARS:VEHI2
150152 CRS0105 VEH 0002 P  SR1                 10 SMART ST
[CARS:VEHI3
150203 CRS0110 VEH 0003 D  0204                54 PUTNAM AV
[CARS:VEHI4
150223 CRS0110 VEH 0004 D  0201                30 MT.AUBURN ST
[CARS:VEHI5
150237 CRS0128 VEHICLE IS BROKEN DOWN
[CARS:VEHI6
150245 CRS0105 VEH 0006 P  SR5                 100 AUBURN ST
[CARS:VEHI1
150255 CRS0110 VEH 0001 D  SR9                 HARVARD SQ
[CARS:VEHI1
150307 CRS0110 VEH 0001 D  0200                HARVARD SQ
[CARS:VEHI1
150317 CRS0110 VEH 0001 D  0199                HARVARD SQ
[CARS:VEHI1
150329 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
150346 CRS0105 VEH 0002 P  ROMONA              100 MEMORIAL DR
[CARS:VEHI3
150414 CRS0105 VEH 0003 P  MRS UHAUL           4 GRANT ST
[CARS:VEHI4
150426 CRS0115 VEH 0004 NOW UNASSIGNED
[CARS:VEHI6
150434 CRS0110 VEH 0006 D  SR5                 HARVARD SQ
[CARS:VEHI2
150448 CRS0110 VEH 0002 D  ROMONA              YMCA
[CARS:VEHI2
150513 CRS0110 VEH 0002 D  0500                11 DUNSTER ST
[CARS:VEHI3
150540 CRS0110 VEH 0003 D  MRS UHAUL           POST OFFICE
[CARS:VEHI6
150615 CRS0110 VEH 0006 D  SR4                 HARVARD SQ
[CARS:VEHI6
150630 CRS0110 VEH 0006 D  SR6                 HARVARD SQ
[CARS:VEHI6
150641 CRS0110 VEH 0006 D  SMA10               MORSE SCHOOL
[CARS:
[CARS:VEHI3
150720 CRS0105 VEH 0003 P  YOSSARIAN           POLICE DEPT.
[CARS:ANOM003 5
150733 CRS0255 5     AT NEXT STOP FOR  003
```

4

```
[CARS:
[CARS:
[CARS:VEHI1
151123 CRS0105 VEH 0001 P  MAID 1             HARVARD SQ
151125 CRS0110 VEH 0001 D  MAID 1             60 WADSWORTH ST
[CARS:VEHI3
151142 CRS0110 VEH 0003 D  YOSSARIAN          2 ERIE ST
[CARS:VEHI2
151152 CRS0110 VEH 0002 D  SR1                HARVARD SQ
[CARS:VEHI4
151153 CRS0105 VEH 0004 P  MAID 2             HARVARD SQ
151204 CRS0110 VEH 0004 D  MAID 2             10 FRONT ST
```

5

1.2.6-2

```
      [CARS:RST05
      151225 CRS0240 ENTER VEHICLE LOCATION
      [CARS:10 PERRY ST
      151240 CRS0246 VEHICLE 0005 RESTORED
      [CARS:VEHI6
      151248 CRS0110 VEH 0006 D  0315               CARS
      [CARS:VEHI2
      151310 CRS0110 VEH 0002 D  SR2                HARVARD SQ
      [CARS:VEHI2
      151323 CRS0110 VEH 0002 D  SR3                HARVARD SQ
      [CARS:VEHU@VEHI2
      151339 CRS0105 VEH 0002 P  MAID 3             HARVARD SQ
      [CARS:VEHI2
      151417 CRS0105 VEH 0002 P  MAID 4             HARVARD SQ
      [CARS:VEHI2
      151452 CRS0105 VEH 0002 P  MAID 5             HARVARD SQ
      [CARS:VEHI2
      151517 CRS0105 VEH 0002 P  MAID 6             HARVARD SQ
      [CARS:VEHI2
      151537 CRS0105 VEH 0005 P  MAID 8             HARVARD SQ
      151556 CRS0105 VEH 0002 P  MAID 7             HARVARD SQ
      [CARS:VEHI2
      151630 CRS0110 VEH 0002 D  MAID 4             12 COTTAGE ST
      VEHI3[CARS:VEHI3
      151700 CRS0115 VEH 0003 NOW UNASSIGNED
      [CARS:VEHI1
      151720 CRS0115 VEH 0001 NOW UNASSIGNED
```

```
[CARS:VEHI6
151725 CRS0105 VEH 0003 P  MAID 11              HARVARD SQ
151728 CRS0115 VEH 0006 NOW UNASSIGNED
[CARS:VEHI5
151743 CRS0105 VEH 0005 P  MAID 9               HARVARD SQ
[CARS:VEHI4
151753 CRS0115 VEH 0004 NOW UNASSIGNED
[CARS:VEHI3
151807 CRS0110 VEH 0003 D  MAID 11              222 RIVER ST
[CARS:
[CARS:
152245 CRS0170 VEH 0005 5 MINS OVERDUE HARVARD SQ
[CARS:VEHI5
152332 CRS0105 VEH 0005 P  MAID 10              HARVARD SQ
[CARS:VEHI2
152351 CRS0110 VEH 0002 D  MAID 7               57 ALLSTON ST
[CARS:VEHI3
152407 CRS0105 VEH 0003 P  MR IRIGQUOIS         HARVARD SQ
[CARS:VEHI5
152429 CRS0105 VEH 0005 P  MAID 12              HARVARD SQ
[CARS:VEHI4
152718 CRS0125 4    NOT SCHEDULED
[CARS:
```

```
back
135002 CRS0400 06  001 001
35003 CRS0410 001 01       MIT                   MORSE SCHOOL
030 CRS0400 06  001 001        1
35003 CRS0400 02  002 002
135003 CRS0410 002 01      HARVARD SQ            MORSE SCHOOL
135003 CRS0400 02  002 002
135004 CRS0400 05  003 003
35004 CRS0410 003 01       5 WADSWORTH ST        MORSE SCHOOL
35004 CRS0400 05  003 003
135043 CRS0410 004 01      HARVARD SQ            CITY HALL
135043 CRS0400 02  002 004 004 002
135130 CRS0410 005 03      HARVARD SQ            CITY HALL
135131 CRS0400 02  002 005 004 005 004 002
135154 CRS0400 02  005 004 005 004 002
135206 CRS0400 02  004 005 004 002
135215 CRS0400 02  005 004 002
135300 CRS0400 06  001
135402 CRS0400 03  006 006
135402 CRS0410 006 01      1 FRONT ST            HARVARD SQ
02 CRS0400 03 5006 006  3        1
135403 CRS0410 007 01      15 AMES ST            HARVARD SQ
135403 CRS0400 03  006 007 006 007
135404 CRS0410 008 01      10 ALBANY ST          HARVARD SQ
0 CRS0400 03  0065008 007 006 007 002
5404 CRS0410 009101       64 STATE ST          HARVARD SQ
354041CRS0400 03  006 009 008 007 006 007 009 008
405 CRS0410 010 01    1  30 GRANITE ST        HARVARD SQ
5405 CRS0400 06  001 010 010
135406 CRS0410 011 01      29 CROSS ST           HARVARD SQ
5406 CRS0400 02  005 004 002 011 011
135414 CRS0400 05  003
135451 CRS0400 03  009 008 007 007 009 008
135517 CRS0400 02  005 004 002
135542 CRS0400 02  004 002
135555 CRS0400 03  008 007 007 009 008
135602 CRS0410 012 01      2 FRONT ST            MORSE SCHOOL
0 CRS0400 02  004 012 002 013         1
135602 CRS0400 01  013 013
135603 CRS0410 013 01      700 GREEN ST          MORSE SCHOOL
```

```
 03 CRS0400 01  013 013   3          1
 135603 CRS0410 014 01       1 FRANKLIN ST       HARVARD SQ
 03 CRS0400 03  008 007 014 007 009 008 014
504 CRS0400 04  015 015
135604 CRS0410 015 01       1 CENTRAL SQ        HARVARD SQ
 04 CRS0400 04  015 015   3          1
/ 35605 CRS0410 016 01      30 RIVER ST         HARVARD SQ
 135605 CRS0400 04  015 016 015 016
 3605 CRS0410 017 01       700 MEMORIAL DR     HARVARD SQ
 05 CRS0400 06 5001 010 017 010 017
 5610 CRS0410 018 01       27 CROSS ST         10 GRANT ST
 5611 CRS0400 03  008 007 018 014 018 007 009 008 014
 15 CRS0400 02  012 002 012   1
 35641 CRS0400 06  010 017 010 017
 135713 CRS0410 019 01       280 FRANKLIN ST     MORSE SCHOOL
 135713 CRS0400 04  015 019 016 015 016 019
 135725 CRS0400 01  013
 135746 CRS0400 04  019 016 015 016 019
 135804 CRS0400 03  007 018 014 018 007 009 008 014
 135830 CRS0400 05  020 020
 35830 CRS0410 020 01       20 AMES ST          MORSE SCHOOL
 135830 CRS0400 05  020 020
 140108 CRS0410 021 01       11 PUTNAM AV        HARVARD SQ
2 108 CRS0400 01  013 021 021
 40109 CRS0410 022 01       70 PUTNAM AV        HARVARD SQ
140109 CRS0400 04  019 016 022 015 016 022 019
 01104 CRS0410 023 01       50 RIVER ST         HARVARD SQ
 10 CRS0400 01  013 023 021 021 023
 140111 CRS0410 024 01       4 GRANT ST          HARVARD SQ
 11 CRS0400 04  019 016 022 024 015 016 022 024 019
 111 CRS0410 025 01       370 GREEN ST        HARVARD SQ
 111 CRS0400 01  013 025 023 021 021 023 025
 0112 CRS0410 026 01 1     10 COWPERTHWAITE ST MORSE SCHOOL
 121 CRS0400 04  019 016 022 026 024 015 016 022 024 019 026
 0113 CRS0410 027 01       100 AUBURN ST       MORSE SCHOOL
 113 CRS0400 05  020 027 027 020
 140608 CRS0410 028 01       10 COTTAGE ST       MORSE SCHOOL
 140608 CRS0400 02  012 002 012 028 028
 40608 CRS0400 01  025 023 021 021 023 025
 0618 CRS0400 06  017 010 017
 140630 CRS0400 04  016 022 026 024 015 016 022 024 019 026
 140642 CRS0400 03  018 014 018 007 009 008 014
 140652 CRS0400 02  002 012 028 028
 140702 CRS0400 05  027 027 020
 140709 CRS0410 029 01       60 WADSWORTH ST     MORSE SCHOOL
 140709 CRS0400 05  027 027 020 029 029
 140723 CRS0400 02  012 028 028
 140734 CRS0400 02  028 028
 140746 CRS0400 06  010 017
 140759 CRS0400 04  022 026 024 015 016 022 024 019 026
 140809 CRS0400 03  014 018 007 009 008 014
 140832 CRS0400 06  017
 140850 CRS0400 04  026 024 015 016 022 024 019 026
 140903 CRS0400 03  018 007 009 008 014
```

```
  140915 CRS0400 05  027 020 029 029
  140926 CRS0400 05  020 029 029
  140936 CRS0400 04  024 015 016 022 024 019 026
  140948 CRS0400 04  015 016 022 024 019 026
  141001 CRS0400 05  029 029
  141023 CRS0400 01  023 021 021 023 025
  141041 CRS0400 03  007 009 008 014
  141058 CRS0400 06  030 030
  141059 CRS0410 030 01       CENTRAL SQ            MORSE SCHOOL
 59 CRS0400 06  030 1030       4           1
  141100 CRS0410 031 01       10 SMART ST           HARVARD SQ
  1100 CRS0401 02  028 028 031 031
  41101 CRS0410 032 01       20 AUDREY ST          HARVARD SQ
2 01 CRS0400 02 1028 028 032 031 031 032
  141103 CRS0410 033 01       MIT                   HARVARD SQ
  141103 CRS0400 02  028 028 032 033 031 031 032 033
 105 CRS0400 05  0294          1
  141148 CRS0400 02  028 032 033 031 031 032 033
  141202 CRS0400 04  016 022 024 019 026
  141212 CRS0400 04  022 024 019 026
  141224 CRS0400 04  024 019 026
  141234 CRS0400 02  032 033 031 031 032 033
  141243 CRS0400 04  019 026
  141304 CRS0400 01  021 021 023 025
  141314 CRS0400 03  009 008 014
  141324 CRS0400 03  008 014
  141334 CRS0400 06  030
  141344 CRS0400 03  014
  141419 CRS0410 029 03       10 PERRY ST           MORSE SCHOOL
  141419 CRS0400 02  032 029 029 033 031 031 032 033
  141517 CRS0400 04  026
  141534 CRS0400 02  029 029 033 031 031 032 033
3 141601 CRS0400 06  034 034
  141602 CRS0410 034 01       35 SIDNEY ST          HARVARD SQ
  141602 CRS0400 06  034 034
  141604 CRS0410 035 01       100 AUBURN ST         HARVARD SQ
  141605 CRS0400 06  034 035 035 034
  1607 CRS0410 1036 01      79 FRANKLIN ST      HARVARD SQ
  07 CRS0400 061 034 036 4035 035 034 036
  1607 CRS0400 03  037 037
  41608 CRS0410 037 01      58 ALLSTON ST         HARVARD SQ
  08 CRS0400 03 1037 037 4         1
  141612 CRS0410 038 01       50 LOPEZ ST           MORSE SCHOOL
  1612 CRS0400 06  034 036 038 035 035 034 036 038
  142103 CRS0400 04  039 039
  142104 CRS0410 039 01       100 MEMORIAL DR       HARVARD SQ
  04 CRS0400 042 039 039 4         1
  142105 CRS0410 040 01       600 MEMORIAL DR       HARVARD SQ
  142105 CRS0400 01  021 021 023 025 040 040
  142106 CRS0410 041 01       9 KINNAIRD ST         HARVARD SQ
  142106 CRS0400 03  037 041 041 037
  142151 CRS0410 042 01       10 ERIE ST            KENDALL SQ
  142151 CRS0400 04  039 042 039 042
```

CrAS11

```
back
150107 CRS0410 049 01       100 MEMORIAL DR      YMCA
150107 CRS0400 02   500 031 049 049 500 031 032 033
150121 CRS0400 01   200 040 200 199
150151 CRS0410 050 01       4 GRANT ST           POST OFFICE
51 CRS0400 03   2040204 050 050          1
150153 CRS0400 02   031 049 049 500 031 032 033
150203 CRS0400 03   204 050 050
150223 CRS0400 04   201
150245 CRS0400 06   035 035 034 036 038 315
150255 CRS0400 01   040 200 199
150307 CRS0400 01   200 199
150317 CRS0400 01   199
150346 CRS0400 02   049 049 500 031 032 033
150414 CRS0400 03   050 050
150435 CRS0400 06   035 034 036 038 315
150448 CRS0400 02   049 500 031 032 033
150513 CRS0400 02   500 031 032 033
150540 CRS0400 03   050
150615 CRS0400 06   034 036 038 315
150630 CRS0400 06   036 038 315
150641 CRS0400 06   038 315
150712 CRS0410 051 01       POLICE DEPT.         2 ERIE ST
0712 CRS0400103  050 051 051
150720 CRS0400 03   051 051
151123 CRS0400 01   052 052
151124 CRS0410 052 01       HARVARD SQ           60 WADSWORTH ST
5 2CRS0400 01  052 0521        5         1
51125 CRS0400 01  052
151142 CRS0400 03   051
151152 CRS0400 02   031 032 033
511531CRS0400 04  053 053
151154 CRS0410 053 01       HARVARD SQ           10 FRONT ST
51154 CRS0400 04  053 053
151204 CRS0400 04   053
```

4

```
151237 CRS0410 054 01      HARVARD SQ          7 LANSDOWNE ST
151237 CRS0400 02  031 032 033 054 054
151248 CRS0400 06  315
151256 CRS0410 055 01      HARVARD SQ          12 COTTAGE ST
51256 CRS0400 02  031 032 033 054 055 055 054
151310 CRS0400 02  032 033 054 055 055 054
151318 CRS0410 056 01      HARVARD SQ          1 HAYWARD ST
151318 CRS0400 02  032 033 054 055 056 055 054 056
513231CRS0400 02  033 054 055 056 055 054 056
151336 CRS0410 057 01      HARVARD SQ          SUB SHOP
151336 CRS0400 02  033 054 055 056 057 055 054 057 056
151340 CRS0400 02  054 055 056 057 055 054 057 056
151417 CRS0400 02  055 056 057 055 054 057 056
151452 CRS0400 02  056 057 055 054 057 056
1455 CRS0510 058 011      HARVARD SQ          57 ALLSTON ST
151455 CRS0400 02  056 057 058 055 058 054 057 056
151517 CRS0400 02  057 058 055 058 054 057 056
151537 CRS0400 05  059 059
51538 CRS0410 059 01      HARVARD SQ          10 DECATUR ST
151538 CRS0400 05  059 059
151556 CRS0400 02  058 055 058 054 057 056
151625 CRS0410 060 01      HARVARD SQ          72 PLEASANT ST
6251 CRS0400 05  059 061 060 059
151630 CRS0400 02  055 058 054 057 056
151700 CRS0410 061 01      HARVARD SQ          312 PEARL ST
151700 CRS0400 05  059 060 061 060 059 061
151725 CRS0400 03  062 062
51721 CRS0410 062 01      HARVARD SQ          222 RIVER ST
26 CRS0400103  062 052        1
151743 CRS0400 05  060 061 060 059 061
151753 CRS0410 063 01      HARVARD SQ          11 VALENTINE ST
151753 CRS0400 05  060 061 063 060 059 063 061
151807 CRS0400 03  062
151810 CRS0410 064 01      HARVARD SQ          KENDALL SQ
151810 CRS0400 05  060 061 063 064 060 059 063 061 064
152332 CRS0400 05  061 063 064 060 059 063 061 064
152351 CRS0400 02  058 054 057 056
152357 CRS0410 065 01      HARVARD SQ          3 KINNAIRD ST
152357 CRS0400 03  062 065 065
152407 CRS0400 03  065 065
152429 CRS0400 05  063 064 060 059 063 061 064
152440 CRS0410 066 01      HARVARD SQ          10 GREEN ST
152440 CRS0400 03  065 066 065 066
```

1.3.2

```
pass
first
kendall sq
harvard sq
114209 CRS0000 FIRST                V  0014 P  0001 D  0013
second
faculty club
14 plympton st
114228 CRS0000 SECOND               V  0014 P  0002 D  0013
cncl
114403 CRS0290                      NOT FOUND
cnclfirst
114414 CRS0275 FIRST                 TIME  0000  V 0003    FACULTY CLUB
yes
114425 CRS0300 FIRST                CANCELLED
```

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:
114209 CRS0105 VEH 0014 P  FIRST                   KENDALL SQ
[CARS:VEHI14
114240 CRS0105 VEH 0014 P  SECOND                  FACULTY CLUB
[CARS:BREA14
114330 CRS0130 ENTER LOCATION OF BREAK-DOWN
[CARS:FACULTY CLUB
114344 CRS0105 VEH 0003 P  FIRST                   FACULTY CLUB
114345 CRS0134 0002 DEMANDS REASSIGNED FOR VEHICLE 0014
[CARS:
114425 CRS0280  NEXT STOP FOR VEHICLE  0003  CANCELLED.
114426 CRS0105 VEH 0003 P  SECOND                  FACULTY CLUB
[CARS:
```

1,3 B

```
pass
john smith@005 first
kendall sq
harvard sq
083146 CRS0000 FIRST                   V  0014 P  0001 D  0013
003 second
kendall sq
harvard sq
083215 CRS0000 SECOND                  V  0014 P  0002 D  0014
third
morse school
city hall
083333 CRS0000 THIRD                   V  0007 P  0001 D  0007
fail1
cars
mir
083732 CRS0010 MIR                     NOT IN SERVICE AREA
mit@@mit
083741 CRS0000 FAIL1                   V  0003 P  0001 D  0005
fail2
cars@cnclfail1
083804 CRS0275 FAIL1                    TIME  0008  V 0003   CARS
cancel
083814 CRS0300 FAIL1                   CANCELLED
fail2
cars
mit
083858 CRS0000 FAIL2                   V  0003 P  0001 D  0006
fail3
sub shop
lafayette sq
083916 CRS0000 FAIL3                   V  0016 P  0001 D  0004
fail4
lafayette sq
city hall
083935 CRS0000 FAIL4                   V  0019 P  0001 D  0006
fail5
mit
city hall
083951 CRS0000 FAIL5                   V  0001 P  0001 D  0007
fail6
mit
lafat#yette sq
084031 CRS0000 FAIL6                   V  0001 P  0002 D  0006
cnclfail3
084051 CRS0275 FAIL3                    TIME  0010  V 0016   SUB SHOP
1 CRS0285 5ON VEHICLE - GIVE VEHICLE LOCATION    0
city hall
084105 CRS0150  VEH0016 AT CITY HALL
4105 CRS0300 FAIL3                   CANCELLED
```

```
vehi
hoohaa
082850 CRS0120 AA   INVALID

vehi
082950 CRS0120      INVALID
vehi1
082956 CRS0125 1    NOT SCHEDULED
hoohaa
083108 CRS0120 AA   INVALID

083146 CRS0105 VEH 0014 P  FIRST                KENDALL SQ          0005



vehi14
083240 CRS0105 VEH 0014 P  SECOND               KENDALL SQ          0003
anom00142
083302 CRS0255 2      AT NEXT STOP FOR  0014
vehi14
083319 CRS0110 VEH 0014 D  FIRST                HARVARD SQ

083333 CRS0105 VEH 0007 P  THIRD                MORSE SCHOOL
anom00140000
083401 CRS0260    ERROR -- NOT A PICK-UP STOP - MONITOR SWITCHES SET
anom00070
083424 CRS0250  IS THIS A NO SHOW FOR  0007 (ANSWER YES FOR NO-SHOW)
yes
083436 CRS0117 VEH 0007 DISPATCHED TO STATION  0002
36 CRS0255      3AT NEXT STOP FOR  0007
cnclsecond
083507 CRS0275 SECOND                 TIME  0003  V 0014    KENDALL SQ
 CRS0285  ON VEHICLE - GIVE VEHICLE LOCATION8         0
yes@800 memorial
083536 CRS0010 800 MEMORIAL          NOT IN SERVICE AREA
63CRS0155  VEH0014 NOTMOVE    8         0
3536 CRS0300  TRY NEW ADDRESS OR QUIT
800 memorial dr
083554 CRS0150  VEH0014 AT 800 MEMORIAL DR
554 C  3        8        0
    RS0300 SECOND                 CANCELLED
554 C  3        8        0
    RS0110 VEH 0014 D  FIRST                HARVARD SQ


vehi14
083632 CRS0117 VEH 0014 DISPATCHED TO STATION  0002
vehi14
083641 CRS0115 VEH 0014 NOW UNASSIGNED
ven#hi7
083657 CRS0115 VEH 0007 NOW UNASSIGNED
```

1.3.3

1.3.4

```
pass
first
kendall sq
harvard sq
072906 CRS0000 FIRST                    V  0014 P  0001 D  0013
second
morse school
city hall
072950 CRS0000 SECOND                   V  0007 P  0001 D  0007
third
45 green st
harvard sq
073711 CRS0000 THIRD                    V  0016 P  0002 D  0011
first
sub shop
harvard sq
074403 CRS0000 FIRST                    V  0016 P  0001 D  0010
second
morse school
city hall
074423 CRS0000 SECOND                   V  0008 P  0002 D  0008
```

1.3.4

```
                 vehi

072906 CRS0105 VEH 0014 P  FIRST                  KENDALL SQ

072950 CRS0105 VEH 0007 P  SECOND                 MORSE SCHOOL
vehi14
073032 CRS0110 VEH 0014 D  FIRST                  HARVARD SQ
brea14
073050 CRS0130 ENTER LOCATION OF BREAK-DOWN
sub shop
073059 CRS0105 VEH 0016 P  FIRST                  SUB SHOP
59 CRS0134 0001 DEMANDS REASSIGNED FOR VEHICLE 0014

n
073246 CRS0120      INVALID


073453 CRS0170 VEH 0007 5 MINS OVERDUE MORSE SCHOOL
brea7
073615 CRS0170 VEH 0016 5 MINS OVERDUE SUB SHOP
615 CRS0130 ENTER LOCATION OF BREAK-DOWN
45 green st
073632 CRS0105 VEH 0018 P  SECOND                 MORSE SCHOOL
23CRS0134 0001 DEMANDS REASSIGNED FOR VEHICLE 0007

vehi16
073936 CRS0105 VEH 0016 P  THIRD                  45 GREEN ST
vehi16
073948 CRS0110 VEH 0016 D  FIRST                  HARVARD SQ
vehi16
074021 CRS0110 VEH 0016 D  THIRD                  HARVARD SQ
vehi16
074030 CRS0117 VEH 0016 DISPATCHED TO STATION  0002
vehi18
074044 CRS0110 VEH 0018 D  SECOND                 CITY HALL

vehi18
074303 CRS0117 VEH 0018 DISPATCHED TO STATION  0002
loca0016front st
074323 CRS0150  VEH0016 AT FRONT ST
loca001812 peters st
074343 CRS0150  VEH0018 AT 12 PETERS ST

074403 CRS0105 VEH 0016 P  FIRST                  SUB SHOP

074423 CRS0105 VEH 0008 P  SECOND                 MORSE SCHOOL
```

1.3.5

a

```
pass
arnie
0 40 st
60 40 st
105852 CRS0000 ARNIE                V  0001 P  0001 D  0007
bo #b
20 40 st
4o#0 40 st
105925 CRS0000 BOB                  V  0001 P  0002 D  0006
```

b

```
a
 r
  n
   ie
0 40 st
60 40 st
110039 CRS0000 ARNIE                V  0001 P  0001 D  0007
bob
20 40 st
40 40 st
110309 CRS0000 BOB                  V  0001 P  0002 D  0006
```

c

```
arnie
0 40 st
60 40 st
110504 CRS0000 ARNIE                V  0001 P  0001 D  0007
bob
20 40 st
40 40 st
110835 CRS0000 BOB                  V  0001 P  0002 D  0006
arnie
110904 CRS0008 NAME ALREADY KNOWN TO SYSTEM - TRY AGAIN
```

```
     arnie
     0 40 st
     60 40 st
     111003 CRS0000 ARNIE                 V  0001 P  0001 D  0007
     bob
c(2) 20 40 st
     40 40 st
     111401 CRS0000 BOB                   V  0001 P  0002 D  0006
     cnclbob
     111417 CRS0275 BOB                    TIME  0016  V 0001    20 40 ST
     yes
     111425 CRS0300 BOB                   CANCELLED
     bob
     20 40 st
     40 40 st
     111439 CRS0000 BOB                   V  0002 P  0002 D  0006
     arnie
     0 40 st
     60 40 st
d    111630 CRS0000 ARNIE                 V  0001 P  0001 D  0007
     bob
     20 40 st
     40 40 st
     111649 CRS0000 BOB                   V  0001 P  0003 D  0006
```

I.3.5

A

```
      [[[[[[[[[[[[[[[[CARS:VEHI[CARS:
[CARS:LOCA001 0 60 ST
105834 CRS0150  VEH0001 AT 0 60 ST
[CARS:LOCA002 20 0 ST
105847 CRS0150  VEH0002 AT 20 0 ST
[CARS:
105852 CRS0105 VEH 0001 P  ARNIE               0 40 ST
[CARS:VEHI1
105932 CRS0105 VEH 0001 P  BOB                 20 40 ST
[CARS:VEHI1
105941 CRS0110 VEH 0001 D  BOB                 40 40 ST
[CARS:VEHI1
105950 CRS0110 VEH 0001 D  ARNIE               60 40 ST
[CARS:VEHI1
110000 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

B

```
      LOCA001 0 60 ST
110013 CRS0150  VEH0001 AT 0 60 ST
[CARS:
110039 CRS0105 VEH 0001 P  ARNIE               0 40 ST
[CARS:VEHI1
110319 CRS0105 VEH 0001 P  BOB                 20 40 ST
[CARS:VEHI1
110330 CRS0110 VEH 0001 D  BOB                 40 40 ST
[CARS:VEHI1
110340 CRS0110 VEH 0001 D  ARNIE               60 40 ST
[CARS:VEHI1
110350 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

1.3.5 C.

```
      LOCA00010 60 ST
110409 CRS0150  VEH0001 AT 0 60 ST
[CARS:
110504 CRS0105 VEH 0001 P  ARNIE                     0 40 ST
[CARS:
[CARS:VEHI1
110844 CRS0105 VEH 0001 P  BOB                       20 40 ST
[CARS:VEHI1
110854 CRS0110 VEH 0001 D  BOB                       40 40 ST
[CARS:VEHI1S
110905 CRS0110 VEH 0001 D  ARNIE                     60 40 ST
[CARS:VEHI1
110916 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:
```

C.2

```
      LOCA001 0 60 ST
110931 CRS0150  VEH0001 AT 0 60 ST
[CARS:
111002 CRS0105 VEH 0001 P  ARNIE                     0 40 ST
[CARS:GGGG
111121 CRS0120      INVALID
[CARS:GGG
111225 CRS0120      INVALID
[CARS:GGG
111351 CRS0120      INVALID
[CARS:VEHI1S
111439 CRS0105 VEH 0002 P  BOB                       20 40 ST
111453 CRS0110 VEH 0001 D  ARNIE                     60 40 ST
[CARS:VEHI1S
111510 CRS0115 VEH 0001 NOW UNASSIGNED
[CARS:VEHI2
111518 CRS0110 VEH 0002 D  BOB                       40 40 ST
[CARS:VEHI2
111527 CRS0115 VEH 0002 NOW UNASSIGNED
[CARS:
```

1,3,5 D

```
     LOCA001 0 60 ST
111541 CRS0150  VEH0001 AT 0 60 ST
[CARS:LOCA002 20 0 ST
111558 CRS0150  VEH0002 AT 20 0 ST
[CARS:
111630 CRS0105 VEH 0001 P  ARNIE                    0 40 ST
[CARS:
[CARS:
[CARS:
[CARS:S
112234 CRS0170 VEH 0001 5 MINS OVERDUE 0 40 ST
112234 CRS0120      INVALID
[CARS:TIME
112457 CRS0120      INVALID
[CARS:TIME
112543 CRS0120      INVALID
[CARS:TIME
112611 CRS0120      INVALID
[CARS:TIME
112622 CRS0120      INVALID
[CARS:TIME
112633 CRS0120      INVALID
[CARS:TIME
112642 CRS0120      INVALID
[CARS:TIME
112650 CRS0120      INVALID
[CARS:
[CARS:
112729 CRS0175 VEH 0001 10 INS OVERDUE 0 40 ST
[CARS:
```

I.3.6

```
 .. CONNECTED ..
XCARS:VEHICARS:
CARS:LOCA110 30 ST
143257 CRS0120 110  INVALID
CARS:LOCA110 30 ST
143314 CRS0120 110  INVALID
CARS:LOCA000110 30 ST
143335 CRS0150  VEH0001 AT 10 30 ST
CARS:LOCA000270 10 ST
143355 CRS0150  VEH0002 AT 70 10 ST
CARS:
143431 CRS0105 VEH 0001 P  ARNIE               10 50 ST
CARS:VEHI1
143553 CRS0105 VEH 0001 P  BOB                 40 70 ST
CARS:VEHI1
143616 CRS0110 VEH 0001 D  BOB                 60 70 ST
CARS:VEHI1
143630 CRS0110 VEH 0001 D  ARNIE               90 50 ST
CARS:VEHI1
143647 CRS0115 VEH 0001 NOW UNASSIGNED
CARS:




     LOCA000110 30 ST
143715 CRS0150  VEH0001 AT 10 30 ST
CARS:
143837 CRS0105 VEH 0001 P  ARNIE               10 50 ST
CARS:
144003 CRS0105 VEH 0002 P  BOB                 40 70 ST
CARS:VEHI1
144033 CRS0110 VEH 0001 D  ARNIE               90 50 ST
CARS:VEHI2
144052 CRS0110 VEH 0002 D  BOB                 60 70 ST
CARS:VEHI1
144134 CRS0115 VEH 0001 NOW UNASSIGNED
CARS:VEHI2
144156 CRS0115 VEH 0002 NOW UNASSIGNED
CARS:
```

I.3.6

```
d cars10
 .. connected ..
pass

arnie
10 50 st
90 50 st
143431 CRS0000 ARNIE                          V  0001 P  0001 D  0008
bob
40 70 st
60 70 st
143512 CRS0000 BOB                            V  0001 P  0003 D  0007
p#



prir0002arnie
10 50 st
90 50 st
143837 CRS0000 ARNIE                          V  0001 P  0001 D  0008
bob
40 70 st
60 70 st
144007 CRS0000 BOB                            V  0002 P  0004 D  0007
```

O D-A-R ACCEPTANCE TEST

TEST DATA

SECTION 2

This section contains reproductions of the light speed printer output resulting from the tests of 27 May through 24 June, 1971.

APPENDIX F

TRANSACTION FILE FROM SCENARIO I.2.3-A

```
                    FILE = FILE      FT08F001 P1:

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 BOB
 ORIGIN TIME                 3.95
 ACCOUNT NO.                    0
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    1
 TRIP NO.                       0
 PICKUP ADDRESS       CAPS
 PICKUP COORDINATES      (200, 62)
 PICKUP ZONE                    0
 EXPECTED TIME               3.95
 PICKUP TIME                 4.55     .6
 DELIVERY ADDRESS     77 MASS AV
 DELIVERY COORDINATES   (187, 42)
 DELIVERY ZONE                  0
 EXPECTED TIME               6.99
 DELIVERY TIME               6.65     .3

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 DAN     .65
 ORIGIN TIME                 4.47
 ACCOUNT NO.                    0
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    1
 TRIP NO.                       0
 PICKUP ADDRESS       77 MASS AV
 PICKUP COORDINATES      (187, 42)
 PICKUP ZONE                    0
 EXPECTED TIME               8.50
 PICKUP TIME                 6.78
 DELIVERY ADDRESS     POST OFFICE
 DELIVERY COORDINATES   (144, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              13.61
 DELIVERY TIME              14.13

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 ED
 ORIGIN TIME                 5.72
 ACCOUNT NO.                    0
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    1
 TRIP NO.                       0
 PICKUP ADDRESS       425 MASS AV
 PICKUP COORDINATES    (163, 45)
 PICKUP ZONE                   0
 EXPECTED TIME             11.16
 PICKUP TIME                9.72
 DELIVERY ADDRESS   550 GREEN ST
 DELIVERY COORDINATES  (132, 44)
 DELIVERY ZONE                 0
 EXPECTED TIME             15.51
 DELIVERY TIME             16.50

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               CHARLIE
 ORIGIN TIME                5.13
 ACCOUNT NO.                   0
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS     100 PLYMPTON ST
 PICKUP COORDINATES    (111, 40)
 PICKUP ZONE                   0
 EXPECTED TIME              7.74
 PICKUP TIME                8.15
 DELIVERY ADDRESS   705 MEMORIAL DR
 DELIVERY COORDINATES  (142,  6)
 DELIVERY ZONE                 0
 EXPECTED TIME             13.14
 DELIVERY TIME             16.65

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               ARNIE
 ORIGIN TIME                3.63
 ACCOUNT NO.                   0
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS     20 PUTNAM AV
 PICKUP COORDINATES    (122, 44)
 PICKUP ZONE                   0
 EXPECTED TIME              6.00
 PICKUP TIME                5.70
 DELIVERY ADDRESS   200 VASSAR ST
 DELIVERY COORDINATES  (176, 39)
 DELIVERY ZONE                 0
 EXPECTED TIME             12.43
 DELIVERY TIME             23.12
```

```
TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 GEORGE
 ORIGIN TIME                7.17
 ACCOUNT NO.                   0
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS       300 WESTERN AV
 PICKUP COORDINATES     (134, 30)
 PICKUP ZONE                   0
 EXPECTED TIME             10.84
 PICKUP TIME               13.65
 DELIVERY ADDRESS     200 VASSAR ST
 DELIVERY COORDINATES   (176, 30)
 DELIVERY ZONE                 0
 EXPECTED TIME             19.45
 DELIVERY TIME             23.30

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 FRANK
 ORIGIN TIME                8.65
 ACCOUNT NO.                   0
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   1
 TRIP NO.                      0
 PICKUP ADDRESS       CENTRAL SQ
 PICKUP COORDINATES     (150, 46)
 PICKUP ZONE                   0
 EXPECTED TIME             11.74
 PICKUP TIME               12.65
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME             18.52
 DELIVERY TIME             24.13

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 HARRY
 ORIGIN TIME               10.48
 ACCOUNT NO.                   0
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS       200 ALLSTON ST
 PICKUP COORDINATES     (151, 19)
 PICKUP ZONE                   0
 EXPECTED TIME             16.69
 PICKUP TIME                 19.68
 DELIVERY ADDRESS    77 MASS AV
 DELIVERY COORDINATES   (187, 42)
 DELIVERY ZONE                   0
 EXPECTED TIME               22.83
 DELIVERY TIME               25.13

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                INGRID
 ORIGIN TIME                 14.63
 ACCOUNT NO.                     0
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     2
 TRIP NO.                        0
 PICKUP ADDRESS      77 MASS AV
 PICKUP COORDINATES     (187, 42)
 PICKUP ZONE                     0
 EXPECTED TIME               25.66
 PICKUP TIME                 25.60
 DELIVERY ADDRESS    CARS
 DELIVERY COORDINATES   (200, 62)
 DELIVERY ZONE                   0
 EXPECTED TIME               28.70
 DELIVERY TIME               28.10

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                JUDY
 ORIGIN TIME                 17.65
 ACCOUNT NO.                     0
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     1
 TRIP NO.                        0
 PICKUP ADDRESS      HARVARD SQ
 PICKUP COORDINATES     (101, 47)
 PICKUP ZONE                     0
 EXPECTED TIME               20.81
 PICKUP TIME                 24.33
 DELIVERY ADDRESS    1045 MASS AV
 DELIVERY COORDINATES   (124, 46)
 DELIVERY ZONE                   0
 EXPECTED TIME               23.76
 DELIVERY TIME               30.82

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                LINDA
 ORIGIN TIME                 27.42
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     CAFS
 PICKUP COORDINATES   (200, 62)
 PICKUP ZONE                  0
 EXPECTED TIME            29.14
 PICKUP TIME              28.25
 DELIVERY ADDRESS   JOYCE CHEN
 DELIVERY COORDINATES (180, 18)
 DELIVERY ZONE                0
 EXPECTED TIME            34.78
 DELIVERY TIME            31.28

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               KATHY
 ORIGIN TIME              20.65
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  1
 TRIP NO.                     0
 PICKUP ADDRESS     CITY HALL
 PICKUP COORDINATES   (144, 47)
 PICKUP ZONE                  0
 EXPECTED TIME            27.23
 PICKUP TIME              37.80
 DELIVERY ADDRESS   20 LOPEZ ST
 DELIVERY COORDINATES (157, 33)
 DELIVERY ZONE                0
 EXPECTED TIME            29.76
 DELIVERY TIME            41.22

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               OLIVIA
 ORIGIN TIME              25.63
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  1
 TRIP NO.                     0
 PICKUP ADDRESS     MORSE SCHOOL
 PICKUP COORDINATES   (156,  5)
 PICKUP ZONE                  0
 EXPECTED TIME            35.93
 PICKUP TIME              42.65     6.7
 DELIVERY ADDRESS   77 MASS AV
 DELIVERY COORDINATES (187, 42)
 DELIVERY ZONE                0
 EXPECTED TIME                41.56  6.9
 DELIVERY TIME                48.43

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                   MARTHA
 ORIGIN TIME                  28.62
 ACCOUNT NO.                      0
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      2
 TRIP NO.                         0
 PICKUP ADDRESS         CARS
 PICKUP COORDINATES        (200, 62)
 PICKUP ZONE                      0
 EXPECTED TIME                39.53
 PICKUP TIME                  34.78
 DELIVERY ADDRESS       HARVARD SQ
 DELIVERY COORDINATES      (101, 47)
 DELIVERY ZONE                    0
 EXPECTED TIME                50.69
 DELIVERY TIME                51.12

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                   NORA
 ORIGIN TIME                  30.10
 ACCOUNT NO.                      0
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      2
 TRIP NO.                         0
 PICKUP ADDRESS         705 MEMORIAL DR
 PICKUP COORDINATES        (142,  6)
 PICKUP ZONE                      0
 EXPECTED TIME                48.61
 PICKUP TIME                  37.63
 DELIVERY ADDRESS       HARVARD SQ
 DELIVERY COORDINATES      (101, 47)
 DELIVERY ZONE                    0
 EXPECTED TIME                55.78
 DELIVERY TIME                51.37

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                   PAULA
 ORIGIN TIME                  37.67
 ACCOUNT NO.                      0
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      1
 TRIP NO.                         0
 PICKUP ADDRESS         77 MASS AV
 PICKUP COORDINATES        (187, 42)
```

```
  PICKUP ZONE                    0
  EXPECTED TIME              50.32
  PICKUP TIME                48.57
  DELIVERY ADDRESS   CITY HALL
  DELIVERY COORDINATES  (144, 47)
  DELIVERY ZONE                  0
  EXPECTED TIME              55.42
  DELIVERY TIME              53.60

 TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
  NAME               TRICIA
  ORIGIN TIME                50.63
  ACCOUNT NO.                    0
  PRIORITY CLASS                 1
  NO. PASSENGERS                 1
  VEHICLE NO.                    1
  TRIP NO.                       0
  PICKUP ADDRESS     MORSE SCHOOL
  PICKUP COORDINATES    (156,  5)
  PICKUP ZONE                    0
  EXPECTED TIME              58.82
  PICKUP TIME                59.12
  DELIVERY ADDRESS   CARS
  DELIVERY COORDINATES  (200, 62)
  DELIVERY ZONE                  0
  EXPECTED TIME              66.98
  DELIVERY TIME              63.62

 TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
  NAME               QUENTIN
 ORIGIN TIME                 48.70
 ACCOUNT NO.                     0
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     2
 TRIP NO.                        0
 PICKUP ADDRESS      HARVARD SQ
 PICKUP COORDINATES     (101, 47)
 PICKUP ZONE                     0
 EXPECTED TIME               50.20
 PICKUP TIME                 51.53
 DELIVERY ADDRESS    CENTRAL SQ
 DELIVERY COORDINATES   (150, 46)
 DELIVERY ZONE                   0
 EXPECTED TIME               55.91
 DELIVERY TIME               63.90

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                RACHEL
 ORIGIN TIME                 49.13
 ACCOUNT NO.                     0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                  0
 EXPECTED TIME            51.13
 PICKUP TIME              51.67
 DELIVERY ADDRESS   MIT
 DELIVERY COORDINATES  (187, 42)
 DELIVERY ZONE                0
 EXPECTED TIME            61.31
 DELIVERY TIME            67.62

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               SUSAN
 ORIGIN TIME              50.10
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     MIT
 PICKUP COORDINATES    (187, 42)
 PICKUP ZONE                  0
 EXPECTED TIME            62.77
 PICKUP TIME              67.78
 DELIVERY ADDRESS   705 MEMORIAL DR
 DELIVERY COORDINATES  (142,  6)
 DELIVERY ZONE                0
 EXPECTED TIME            69.41
 DELIVERY TIME            71.73


STATISTICS TAKEN ON  20 OF  20 TOTAL TRANSACTIONS

LEVEL OF SERVICE STATISTICS
 MEAN            6.37
 VARIANCE       13.71
 MINIMUM         1.43
 MAXIMUM        19.22

LATENESS
 MEAN            4.06
 VARIANCE       11.63

EARLINESS
 MEAN            2.57
 VARIANCE        7.63

COMBINED
 MEAN           -1.74
```

APPENDIX G

TRANSACTION FILE FOR SCENARIO I.2.6 (BEFORE CRASH)

```
           USERID:  TSCENT2

           ACCT:  14B1

           OUTPUT GENERATED:  09/11/71  AT  11.56.36
           OUTPUT PRINTED:    09/11/71  AT  11.56.44  ON  00E
TRANSACTION INFORMATION FOR CANCELLED TRIP FOLLOWS:
 NAME                SRA1
 ORIGIN TIME                 3.98
 ACCOUNT NO.              1000012
 PRIORITY CLASS                 1
 NO. PASSENGERS                 0
 VEHICLE NO.                    3
 TRIP NO.              1098907648
 PICKUP ADDRESS      1 FRONT ST
 PICKUP COORDINATES     (193, 60)
 PICKUP ZONE                    0
 EXPECTED TIME               7.18
 PICKUP TIME                 0.0
 DELIVERY ADDRESS    HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              14.24
 DELIVERY TIME               4.78

TRANSACTION INFORMATION FOR CANCELLED TRIP FOLLOWS:
 NAME                SRA6
 ORIGIN TIME                 3.98
 ACCOUNT NO.              1000670
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    2
 TRIP NO.              1098907648
 PICKUP ADDRESS      29 CROSS ST
 PICKUP COORDINATES     (174, 41)
 PICKUP ZONE                    0
 EXPECTED TIME              15.79
 PICKUP TIME                 0.0
 DELIVERY ADDRESS    HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              22.97
 DELIVERY TIME               5.23

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                RAIDERS
 ORIGIN TIME                 1.47
 ACCOUNT NO.              1020365
 PRIORITY CLASS                 1
 NO. PASSENGERS                3
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS    HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                   0
 EXPECTED TIME              4.97
 PICKUP TIME                2.05
 DELIVERY ADDRESS  CITY HALL
 DELIVERY COORDINATES  (144, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME              9.89
 DELIVERY TIME              5.67

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME              RALPH NADER
 ORIGIN TIME                0.65
 ACCOUNT NO.             1020365
 PRIORITY CLASS                2
 NO. PASSENGERS                1
 VEHICLE NO.                   2
 TRIP NO.                      0
 PICKUP ADDRESS    HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                   0
 EXPECTED TIME              4.97
 PICKUP TIME                2.22
 DELIVERY ADDRESS  CITY HALL
 DELIVERY COORDINATES  (144, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME              9.39
 DELIVERY TIME              6.22

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME              SMA1
 ORIGIN TIME                 0.0
 ACCOUNT NO.             1002694
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   6
 TRIP NO.             1095761920
 PICKUP ADDRESS    MIT
 PICKUP COORDINATES    (187, 42)
 PICKUP ZONE                   0
 EXPECTED TIME              5.19
 PICKUP TIME                2.97
 DELIVERY ADDRESS  MORSE SCHOOL
 DELIVERY COORDINATES  (156,  5)
 DELIVERY ZONE                 0
 EXPECTED TIME             10.09
 DELIVERY TIME              6.75
```

```
TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SMA3
 ORIGIN TIME               0.0
 ACCOUNT NO.           1002815
 PRIORITY CLASS              1
 NO. PASSENGERS              1
 VEHICLE NO.                 5
 TRIP NO.           1095761920
 PICKUP ADDRESS      5 WADSWORTH ST
 PICKUP COORDINATES    (204, 62)
 PICKUP ZONE                 0
 EXPECTED TIME            8.68
 PICKUP TIME              4.20
 DELIVERY ADDRESS    MORSE SCHOOL
 DELIVERY COORDINATES  (156,  5)
 DELIVERY ZONE               0
 EXPECTED TIME           15.98
 DELIVERY TIME            8.25

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SMA5
 ORIGIN TIME              5.98
 ACCOUNT NO.           1003041
 PRIORITY CLASS              1
 NO. PASSENGERS              1
 VEHICLE NO.                 1
 TRIP NO.           1101004800
 PICKUP ADDRESS      700 GREEN ST
 PICKUP COORDINATES    (121, 43)
 PICKUP ZONE                 0
 EXPECTED TIME           12.00
 PICKUP TIME              7.38
 DELIVERY ADDRESS    MORSE SCHOOL
 DELIVERY COORDINATES  (156,  5)
 DELIVERY ZONE               0
 EXPECTED TIME           17.21
 DELIVERY TIME           16.08

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SMA2
 ORIGIN TIME               0.0
 ACCOUNT NO.           1002703
 PRIORITY CLASS              1
 NO. PASSENGERS              1
 VEHICLE NO.                 2
 TRIP NO.           1095761920
 PICKUP ADDRESS      HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                 0
 EXPECTED TIME            4.47
```

```
  PICKUP TIME                  1.85
  DELIVERY ADDRESS   MORSE SCHOOL
  DELIVERY COORDINATES  (156,  5)
  DELIVERY ZONE                   0
  EXPECTED TIME               11.28
  DELIVERY TIME               17.33

 TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
  NAME                 SMA4
  ORIGIN TIME                  5.98
  ACCOUNT NO.               1002920
  PRIORITY CLASS                  1
  NO. PASSENGERS                  1
  VEHICLE NO.                     2
  TRIP NO.               1101004800
  PICKUP ADDRESS       2 FRONT ST
  PICKUP COORDINATES      (173, 45)
  PICKUP ZONE                     0
  EXPECTED TIME                9.63
  PICKUP TIME                 16.82
FILE: FILE     FT08F001 P1


  DELIVERY ADDRESS   MORSE SCHOOL
  DELIVERY COORDINATES  (156,  5)
  DELIVERY ZONE                   0
  EXPECTED TIME               14.60
  DELIVERY TIME               17.52

 TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
  NAME                 SRA5
  ORIGIN TIME                  3.98
  ACCOUNT NO.               1000565
  PRIORITY CLASS                  1
  NO. PASSENGERS                  1
  VEHICLE NO.                     6
  TRIP NO.               1098907648
  PICKUP ADDRESS       30 GRANITE ST
  PICKUP COORDINATES      (150,  5)
  PICKUP ZONE                     0
  EXPECTED TIME                8.92
  PICKUP TIME                 16.27
  DELIVERY ADDRESS   HARVARD SQ
  DELIVERY COORDINATES  (101, 47)
  DELIVERY ZONE                   0
  EXPECTED TIME               15.30
  DELIVERY TIME               18.50
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TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SRA10
 ORIGIN TIME                 5.98
 ACCOUNT NO.             1001024
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   6
 TRIP NO.             1101004800
 PICKUP ADDRESS       700 MEMORIAL DR
 PICKUP COORDINATES     (142,  6)
 PICKUP ZONE                   0
 EXPECTED TIME             10.15
 PICKUP TIME               17.72
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME             16.44
 DELIVERY TIME             18.67

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SMA7
 ORIGIN TIME               11.08
 ACCOUNT NO.             1003265
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   5
 TRIP NO.             1106247680
 PICKUP ADDRESS       100 AUBURN ST
 PICKUP COORDINATES     (158, 38)
 PICKUP ZONE                   0
 EXPECTED TIME             16.92
 PICKUP TIME               19.22
 DELIVERY ADDRESS     MORSE SCHOOL
 DELIVERY COORDINATES   (156,  5)
 DELIVERY ZONE                 0
 EXPECTED TIME             20.44
 DELIVERY TIME             19.38

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 ROGER WILLIAMS
 ORIGIN TIME                8.47
 ACCOUNT NO.             1000124
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   5
 TRIP NO.                      0
 PICKUP ADDRESS       20 AMES ST
 PICKUP COORDINATES     (182, 56)
 PICKUP ZONE                   0
 EXPECTED TIME             13.69
 PICKUP TIME                16.98
 DELIVERY ADDRESS   MORSE SCHOOL
 DELIVERY COORDINATES  (156,  5)
 DELIVERY ZONE                  0
 EXPECTED TIME              19.41
 DELIVERY TIME              19.98

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               NURSE DUCKETT
 ORIGIN TIME                 6.12
 ACCOUNT NO.                    0
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    3
 TRIP NO.                       0
 PICKUP ADDRESS     27 CROSS ST
 PICKUP COORDINATES    (174, 41)
 PICKUP ZONE                    0
 EXPECTED TIME               9.94
 PICKUP TIME                18.12
 DELIVERY ADDRESS   10 GRANT ST
 DELIVERY COORDINATES  (118, 41)
 DELIVERY ZONE                  0
 EXPECTED TIME              16.06
 DELIVERY TIME              20.65

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SRA8
 ORIGIN TIME                 5.98
 ACCOUNT NO.              1000894
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1101004800
 PICKUP ADDRESS     1 CENTRAL SQ
 PICKUP COORDINATES    (150, 46)
 PICKUP ZONE                    0
 EXPECTED TIME               9.83
 PICKUP TIME                 7.73
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              14.80
 DELIVERY TIME              22.00

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SRA9
 ORIGIN TIME                 5.98
 ACCOUNT NO.              1000903
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1101004800
 PICKUP ADDRESS     30 RIVER ST
 PICKUP COORDINATES    (148, 40)
 PICKUP ZONE                    0
 EXPECTED TIME              10.91
 PICKUP TIME                17.95
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              16.24
 DELIVERY TIME              22.17

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SRA12
 ORIGIN TIME                11.08
 ACCOUNT NO.              1001241
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1106247680
 PICKUP ADDRESS     70 PUTNAM AV
 PICKUP COORDINATES    (125, 40)
 PICKUP ZONE                    0
 EXPECTED TIME              14.86
 PICKUP TIME                18.80
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              18.64
 DELIVERY TIME              22.35

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SMA8
 ORIGIN TIME                16.08
 ACCOUNT NO.              1003370
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    2
 TRIP NO.              1108606976
 PICKUP ADDRESS     10 COTTAGE ST
 PICKUP COORDINATES    (152, 34)
 PICKUP ZONE                    0
 EXPECTED TIME              24.72
 PICKUP TIME                21.77
 DELIVERY ADDRESS   MORSE SCHOOL
 DELIVERY COORDINATES  (156,  5)
 DELIVERY ZONE                  0
 EXPECTED TIME              27.89
 DELIVERY TIME              22.52
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TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SRA14
 ORIGIN TIME                11.08
 ACCOUNT NO.              1001465
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1106247680
 PICKUP ADDRESS       4 GRANT ST
 PICKUP COORDINATES     (118, 41)
 PICKUP ZONE                    0
 EXPECTED TIME              16.01
 PICKUP TIME                19.75
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              19.65
 DELIVERY TIME              22.68

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SRA2
 ORIGIN TIME                 3.98
 ACCOUNT NO.              1000236
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    3
 TRIP NO.              1098907648
 PICKUP ADDRESS       15 AMES ST
 PICKUP COORDINATES     (182, 56)
 PICKUP ZONE                    0
 EXPECTED TIME               8.97
 PICKUP TIME                16.65
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              17.40
 DELIVERY TIME              23.20

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SRA4
 ORIGIN TIME                 3.98
 ACCOUNT NO.              1000453
 PRIORITY CLASS                 1
 NO. PASSENGERS                1
 VEHICLE NO.                   3
 TRIP NO.              1098907648
 PICKUP ADDRESS       64 STATE ST
 PICKUP COORDINATES     (175, 49)
 PICKUP ZONE                   0
 EXPECTED TIME              8.08
 PICKUP TIME                5.88
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME             19.02
 DELIVERY TIME             23.37

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                  SRA3
 ORIGIN TIME                3.98
 ACCOUNT NO.             1000341
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   3
 TRIP NO.              1098907648
 PICKUP ADDRESS       10 ALBANY ST
 PICKUP COORDINATES     (182, 53)
 PICKUP ZONE                   0
 EXPECTED TIME              8.77
 PICKUP TIME                8.03
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME             18.48
 DELIVERY TIME             23.70

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                  SRA7
 ORIGIN TIME                5.98
 ACCOUNT NO.             1000782
 PRIORITY CLASS                1
 NO. PASSENGERS                1
 VEHICLE NO.                   3
 TRIP NO.              1101004800
 PICKUP ADDRESS       1 FRANKLIN ST
 PICKUP COORDINATES     (169, 40)
 PICKUP ZONE                   0
 EXPECTED TIME             10.27
 PICKUP TIME               19.02
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                 0
 EXPECTED TIME             18.51
 DELIVERY TIME             23.87
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TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                 MAJOR MAJOR
 ORIGIN TIME                 7.15

 ACCOUNT NO.                    0
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.                       0
 PICKUP ADDRESS       280 FRANKLIN ST
 PICKUP COORDINATES      (148, 42)
 PICKUP ZONE                    0
 EXPECTED TIME              10.74
 PICKUP TIME                16.47
 DELIVERY ADDRESS     MORSE SCHOOL
 DELIVERY COORDINATES    (156,  5)
 DELIVERY ZONE                  0
 EXPECTED TIME              23.57
 DELIVERY TIME              25.25

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SMA6
 ORIGIN TIME                11.08
 ACCOUNT NO.              1003153
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1106247680
 PICKUP ADDRESS       10 COWPERTHWAITE ST
 PICKUP COORDINATES      (118, 38)
 PICKUP ZONE                    0
 EXPECTED TIME              16.03
 PICKUP TIME                19.57
 DELIVERY ADDRESS     MORSE SCHOOL
 DELIVERY COORDINATES    (156,  5)
 DELIVERY ZONE                  0
 EXPECTED TIME              27.76
 DELIVERY TIME              25.40

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                 SMA9
 ORIGIN TIME                20.92
 ACCOUNT NO.              1003482
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    6
 TRIP NO.              1108934656
 PICKUP ADDRESS       CENTRAL SQ
 PICKUP COORDINATES      (150, 46)
 PICKUP ZONE                    0
 EXPECTED TIME              25.39
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PICKUP TIME                 23.53
DELIVERY ADDRESS     MORSE SCHOOL
DELIVERY COORDINATES  (156,    5)
DELIVERY ZONE                   0
EXPECTED TIME               29.67
DELIVERY TIME               25.85

STATISTICS TAKEN ON  26 OF  26 TOTAL TRANSACTIONS

LEVEL OF SERVICE  STATISTICS
 MEAN             0.05
 VARIANCE         0.00
 MINIMUM          0.00
 MAXIMUM          0.13

LATENESS
 MEAN             4.93
 VARIANCE         4.55

EARLINESS
 MEAN             4.66
 VARIANCE        17.73

COMBINED
 MEAN            -0.51
```

APPENDIX H

TRANSACTION FILE FOR SCENARIO I.2.6 (AFTER CRASH)

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USERID:  TSCENT2

ACCT:  1481

OUTPUT GENERATED:  09/11/71  AT  11.58.33
OUTPUT PRINTED:    09/11/71  AT  11.58.39  ON  00F


BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                 SRA11
 ORIGIN TIME                11.08
 ACCOUNT NO.              1001136
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    1
 TRIP NO.              1106247680
 PICKUP ADDRESS       11 PUTNAM AV
 PICKUP COORDINATES     (122, 44)
 PICKUP ZONE                    0
 EXPECTED TIME              17.81
 PICKUP TIME                41.77
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              20.25
 DELIVERY TIME              41.77

BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                 SRA13
 ORIGIN TIME                11.08
 ACCOUNT NO.              1001353
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    1
 TRIP NO.              1106247680
 PICKUP ADDRESS       50 RIVER ST
 PICKUP COORDINATES     (146, 38)
 PICKUP ZONE                    0
 EXPECTED TIME              16.24
 PICKUP TIME                23.03
 DELIVERY ADDRESS     HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              21.93
 DELIVERY TIME              41.77

BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                 SRA15
 ORIGIN TIME                11.08
 ACCOUNT NO.              1001570
 PRIORITY CLASS                 1
 EXPECTED TIME              39.23
 DELIVERY TIME              41.77

BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                  SR7
 ORIGIN TIME                25.95
 ACCOUNT NO.              1002253
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    3
 TRIP NO.              1109262336
 PICKUP ADDRESS        58 ALLSTON ST
 PICKUP COORDINATES       (161, 19)
 PICKUP ZONE                    0
 EXPECTED TIME              31.99
 PICKUP TIME                41.77
 DELIVERY ADDRESS      HARVARD SQ
 DELIVERY COORDINATES     (101, 47)

 DELIVERY ZONE                  0
 EXPECTED TIME              38.53
 DELIVERY TIME              41.77

BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                  SR8
 ORIGIN TIME                31.00
 ACCOUNT NO.              1002365
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.              1109590016
 PICKUP ADDRESS        100 MEMORIAL DR
 PICKUP COORDINATES       (204, 57)
 PICKUP ZONE                    0
 EXPECTED TIME              37.45
 PICKUP TIME                41.77
 DELIVERY ADDRESS      HARVARD SQ
 DELIVERY COORDINATES     (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              47.39
 DELIVERY TIME              41.77

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                  MR. BANG
 ORIGIN TIME                31.77
 ACCOUNT NO.                    0
 PRIORITY CLASS                 2
 NO. PASSENGERS                 1
 VEHICLE NO.                    4
 TRIP NO.
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                                      0
 PICKUP ADDRESS         10 ERIE ST
 PICKUP COORDINATES       (166, 23)
 PICKUP ZONE                          0
 EXPECTED TIME                    42.60
 PICKUP TIME                      41.77
 NO. PASSENGERS                       1
 VEHICLE NO.                          1
 TRIP NO.                    1106247680
 PICKUP ADDRESS        370 GREEN ST
 PICKUP COORDINATES       (148, 44)
 PICKUP ZONE                          0
 EXPECTED TIME                    16.73
 PICKUP TIME                      20.33
 DELIVERY ADDRESS      HARVARD SQ
 DELIVERY COORDINATES     (101, 47)
 DELIVERY ZONE                        0
 EXPECTED TIME                    23.99
 DELIVERY TIME                    41.77

NON-BILLED CUSTOMER DROPPPED DURING MANUAL OPERATION
 NAME                   HERMAN
 ORIGIN TIME                      17.05
 ACCOUNT NO.                          0
 PRIORITY CLASS                       1
 NO. PASSENGERS                       3
 VEHICLE NO.                          2
 TRIP NO.                             0
 PICKUP ADDRESS         10 PERRY ST
 PICKUP COORDINATES       (152, 36)
 PICKUP ZONE                          0
 EXPECTED TIME                    28.09
 PICKUP TIME                      41.77
 DELIVERY ADDRESS       MORSE SCHOOL
 DELIVERY COORDINATES     (156,  5)
 DELIVERY ZONE                        0
 EXPECTED TIME                    31.44
 DELIVERY TIME                    41.77

BILLED CUSTOMER DROPPED DURING MANUAL OPERATION
 NAME                   SR10
 ORIGIN TIME                      31.00
 ACCOUNT NO.                    1002582
 PRIORITY CLASS                       1
 NO. PASSENGERS                       1
 VEHICLE NO.                          3
 TRIP NO.                    1109590016
 PICKUP ADDRESS         9 KINNAIRD ST
 PICKUP COORDINATES       (132, 42)
 PICKUP ZONE                          0
 EXPECTED TIME                    35.86
 PICKUP TIME                 41.77
 DELIVERY ADDRESS    HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                   0
 DELIVERY ADDRESS    KENDALL SQ
 DELIVERY COORDINATES  (201, 66)
 DELIVERY ZONE                   0
 EXPECTED TIME               59.21
 DELIVERY TIME               43.52

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SR9
 ORIGIN TIME                 31.00
 ACCOUNT NO.               1002470
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     1
 TRIP NO.               1109590016
 PICKUP ADDRESS      600 MEMORIAL DR
 PICKUP COORDINATES    (171,   7)
 PICKUP ZONE                     0
 EXPECTED TIME               42.79
 PICKUP TIME                 42.47

 STATISTICS TAKEN ON  29 OF  29 TOTAL TRANSACTIONS

 LEVEL OF SERVICE STATISTICS
  MEAN             0.07
  VARIANCE         0.00
  MINIMUM          0.01
  MAXIMUM          0.30

 LATENESS
  MEAN            10.91
  VARIANCE       155.07

 EARLINESS
  MEAN             5.17
  VARIANCE        25.05

 COMBINED
  MEAN            -2.87

  NAME                MAID 2
  ORIGIN TIME                 53.02
  ACCOUNT NO.                     0
  PRIORITY CLASS                  1
  NO. PASSENGERS                  1
  VEHICLE NO.                     4
  TRIP NO.                        0
  PICKUP ADDRESS      HARVARD SQ
PICKUP COORDINATES    (101, 47)
PICKUP ZONE                  0
EXPECTED TIME            54.23
PICKUP TIME              53.20
DELIVERY ADDRESS   10 FRONT ST
DELIVERY COORDINATES  (173, 45)
DELIVERY ZONE                0
EXPECTED TIME            61.30
DELIVERY TIME            59.02

ACCOUNT NO.                  0
PRIORITY CLASS               1
NO. PASSENGERS               5
VEHICLE NO.                  3
TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               MAID 4
 ORIGIN TIME              54.05
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                  0
 EXPECTED TIME            58.05
 PICKUP TIME              56.00
 DELIVERY ADDRESS   12 COTTAGE ST
 DELIVERY COORDINATES  (152, 34)
 DELIVERY ZONE                0
 EXPECTED TIME            63.35
 DELIVERY TIME            64.97

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               MAID 11
 ORIGIN TIME              58.55
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  3
 TRIP NO.                     0
 PICKUP ADDRESS     HARVARD SQ
 PICKUP COORDINATES    (101, 47)
 PICKUP ZONE                  0
 EXPECTED TIME            64.87
 PICKUP TIME              59.25
 DELIVERY ADDRESS   222 RIVER ST
 DELIVERY COORDINATES  (140, 28)
 DELIVERY ZONE                0
 EXPECTED TIME               69.32
 DELIVERY TIME               65.25
 TRIP NO.                        0
 PICKUP ADDRESS      POLICE DEPT.
 PICKUP COORDINATES      (148, 42)
 PICKUP ZONE                     0
 EXPECTED TIME               50.82
 PICKUP TIME                 52.83
 DELIVERY ADDRESS    2 ERIE ST
 DELIVERY COORDINATES    (166, 23)
 DELIVERY ZONE                   0
 EXPECTED TIME               53.70
 DELIVERY TIME               58.13

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                MAID 1
 ORIGIN TIME                 52.52
 ACCOUNT NO.                     0
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     1
 TRIP NO.                        0
 PICKUP ADDRESS      HARVARD SQ
 PICKUP COORDINATES      (101, 47)
 PICKUP ZONE                     0
 EXPECTED TIME               52.52
 PICKUP TIME                 52.55
 DELIVERY ADDRESS    60 WADSWORTH ST
 DELIVERY COORDINATES    (202, 64)
 DELIVERY ZONE                   0
 EXPECTED TIME               62.36
 DELIVERY TIME               58.47

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                0315
 ORIGIN TIME                 41.77
 ACCOUNT NO.                     0
 PRIORITY CLASS                  1
 NO. PASSENGERS                  1
 VEHICLE NO.                     6
 TRIP NO.                        0
 PICKUP ADDRESS
 PICKUP COORDINATES      (  0,  0)
 PICKUP ZONE                     0
 EXPECTED TIME                0.0
 PICKUP TIME                 41.77
 DELIVERY ADDRESS    CARS
 DELIVERY COORDINATES    (200, 62)
 DELIVERY ZONE                   0
 EXPECTED TIME               67.37
 DELIVERY TIME                  58.60

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NO. PASSENGERS                   1
 VEHICLE NO.                      2
 TRIP NO.                1108934656
 PICKUP ADDRESS          10 SMART ST
 PICKUP COORDINATES        (175, 46)
 PICKUP ZONE                      0
 EXPECTED TIME                44.92
 PICKUP TIME                  44.90
 DELIVERY ADDRESS        HARVARD SQ
 DELIVERY COORDINATES      (101, 47)
 DELIVERY ZONE                    0
 EXPECTED TIME                53.74
 DELIVERY TIME                54.28

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                    SR2
 ORIGIN TIME                  20.92
 ACCOUNT NO.                1001794
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      2
 TRIP NO.                1108934656
 PICKUP ADDRESS          20 AUDREY ST
 PICKUP COORDINATES        (173, 13)
 PICKUP ZONE                      0
 EXPECTED TIME                26.80
 PICKUP TIME                  25.53
 DELIVERY ADDRESS        HARVARD SQ
 DELIVERY COORDINATES      (101, 47)
 DELIVERY ZONE                    0
 EXPECTED TIME                54.74
 DELIVERY TIME                54.52

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                    SR3
 ORIGIN TIME                  20.92
 ACCOUNT NO.                1001803
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      2
 TRIP NO.                1108934656
 PICKUP ADDRESS          MIT
 PICKUP COORDINATES        (187, 42)
 PICKUP ZONE                      0
 EXPECTED TIME                30.24
 PICKUP TIME                  41.77
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                0
 EXPECTED TIME            55.74
 DELIVERY TIME            54.78

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               YOSSARIAN
 ORIGIN TIME              48.32


 TRIP NO.                     0
 PICKUP ADDRESS     4 GRANT ST
 PICKUP COORDINATES    (118, 41)
 PICKUP ZONE                  0
 EXPECTED TIME            50.17
 PICKUP TIME              46.80
 DELIVERY ADDRESS   POST OFFICE
 DELIVERY COORDINATES  (144, 47)
 DELIVERY ZONE                0
 EXPECTED TIME            53.10
 DELIVERY TIME            48.47

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               0500
 ORIGIN TIME              41.77
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     100 MASS AV
 PICKUP COORDINATES    (187, 42)
 PICKUP ZONE                  0
 EXPECTED TIME            42.77
 PICKUP TIME              43.00
 DELIVERY ADDRESS   11 DUNSTER ST
 DELIVERY COORDINATES  (103, 45)
 DELIVERY ZONE                0
 EXPECTED TIME            52.49
 DELIVERY TIME            52.98

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SMA10
 ORIGIN TIME              25.95
 ACCOUNT NO.            1003594
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  6
 TRIP NO.            1109262336
 PICKUP ADDRESS     50 LOPEZ ST
 PICKUP COORDINATES     (157, 33)
 PICKUP ZONE                    0
 EXPECTED TIME              42.77
 PICKUP TIME                43.88
 DELIVERY ADDRESS    MORSE SCHOOL
 DELIVERY COORDINATES   (156,  5)
 DELIVERY ZONE                  0
 EXPECTED TIME              59.81
 DELIVERY TIME              53.93

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SR1
 ORIGIN TIME                20.92
 ACCOUNT NO.              1001682
 PRIORITY CLASS                 1

 PICKUP COORDINATES     (158, 38)
 PICKUP ZONE                    0
 EXPECTED TIME              44.23
 PICKUP TIME                45.70
 DELIVERY ADDRESS    HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              50.49
 DELIVERY TIME              47.37

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SR4
 ORIGIN TIME                25.95
 ACCOUNT NO.              1001915
 PRIORITY CLASS                 1
 NO. PASSENGERS                 1
 VEHICLE NO.                    6
 TRIP NO.              1109262336
 PICKUP ADDRESS      35 SIDNEY ST
 PICKUP COORDINATES     (166, 41)
 PICKUP ZONE                    0
 EXPECTED TIME              29.36
 PICKUP TIME                41.77
 DELIVERY ADDRESS    HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                  0
 EXPECTED TIME              51.49
 DELIVERY TIME              47.63

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME                SR6
 ORIGIN TIME                25.95
 ACCOUNT NO.              1002141
 PRIORITY CLASS
```

```
                                    1
NO. PASSENGERS                      1
VEHICLE NO.                         6
TRIP NO.                   1109262336
PICKUP ADDRESS         79 FRANKLIN ST
PICKUP COORDINATES         (169, 40)
PICKUP ZONE                         0
EXPECTED TIME                   30.15
PICKUP TIME                     41.77
DELIVERY ADDRESS       HARVARD SQ
DELIVERY COORDINATES       (101, 47)
DELIVERY ZONE                       0
EXPECTED TIME                   52.49
DELIVERY TIME                   47.80

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
NAME                   MRS UHAUL
ORIGIN TIME                     42.92
ACCOUNT NO.                   1020036
PRIORITY CLASS                      1
NO. PASSENGERS                      1
VEHICLE NO.                         3
EXPECTED TIME                   42.77
PICKUP TIME                     43.18
DELIVERY ADDRESS       54 PUTNAM AV
DELIVERY COORDINATES       (125, 40)
DELIVERY ZONE                       0
EXPECTED TIME                   47.87
DELIVERY TIME                   45.37

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
NAME                   0201
ORIGIN TIME                     41.77
ACCOUNT NO.                         0
PRIORITY CLASS                      1
NO. PASSENGERS                      1
VEHICLE NO.                         4
TRIP NO.                            0
PICKUP ADDRESS
PICKUP COORDINATES         (  0,  0)
PICKUP ZONE                         0
EXPECTED TIME                    0.0
PICKUP TIME                     41.77
DELIVERY ADDRESS       30 MT.AUBURN ST
DELIVERY COORDINATES       (114, 44)
DELIVERY ZONE                       0
EXPECTED TIME                   68.39
DELIVERY TIME                   45.55

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
NAME                   ROMONA
```

```
 ORIGIN TIME              42.18
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  2
 TRIP NO.                     0
 PICKUP ADDRESS     100 MEMORIAL DR
 PICKUP COORDINATES    (204, 57)
 PICKUP ZONE                  0
 EXPECTED TIME            48.75
 PICKUP TIME              45.93
 DELIVERY ADDRESS   YMCA
 DELIVERY COORDINATES  (144, 47)
 DELIVERY ZONE                0
 EXPECTED TIME            54.80
 DELIVERY TIME            46.35

TRANSACTION INFORMATION FOR AUTOMATICALLY BILLED COMPLETE TRIP FOLLOWS:
 NAME               SR5
 ORIGIN TIME              25.95
 ACCOUNT NO.            1002036
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  6
 TRIP NO.            1109262336
 PICKUP ADDRESS     100 AUBURN ST
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                0
 EXPECTED TIME            53.99
 DELIVERY TIME            44.23

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME               0200
 ORIGIN TIME              41.77
 ACCOUNT NO.                  0
 PRIORITY CLASS               1
 NO. PASSENGERS               1
 VEHICLE NO.                  1
 TRIP NO.                     0
 PICKUP ADDRESS     LAFAYETTE SQ
 PICKUP COORDINATES    (163, 45)
 PICKUP ZONE                  0
 EXPECTED TIME            47.33
 PICKUP TIME              44.05
 DELIVERY ADDRESS   HARVARD SQ
 DELIVERY COORDINATES  (101, 47)
 DELIVERY ZONE                0
 EXPECTED TIME            54.99
 DELIVERY TIME            44.42
```

```
TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                   0199
 ORIGIN TIME                  41.77
 ACCOUNT NO.                      0
 PRIORITY CLASS                   1
 NO. PASSENGERS                   2
 VEHICLE NO.                      1
 TRIP NO.                         0
 PICKUP ADDRESS
 PICKUP COORDINATES     (  0,   0)
 PICKUP ZONE                      0
 EXPECTED TIME                 0.0
 PICKUP TIME                  41.77
 DELIVERY ADDRESS       HARVARD SQ
 DELIVERY COORDINATES   (101, 47)
 DELIVERY ZONE                    0
 EXPECTED TIME                55.99
 DELIVERY TIME                44.60

TRANSACTION INFORMATION FOR COMPLETED TRIP FOLLOWS:
 NAME                   0204
 ORIGIN TIME                  41.77
 ACCOUNT NO.                      0
 PRIORITY CLASS                   1
 NO. PASSENGERS                   1
 VEHICLE NO.                      3
 TRIP NO.                         0
 PICKUP ADDRESS         23 GREEN ST
 PICKUP COORDINATES     (170, 42)
 PICKUP ZONE                      0
```

APPENDIX I

System Status Dump

During Scenario I. 2.6

```
     SYSTEM STATUS AT TIME     32.433 FOR RUN     1

           ACTIVE DEMAND LIST
  ON         NAME                  NUM   PRTY  ORGTIME    PICTIME    VEH

  21      SRA11                      1     1    11.083      0.0       1
          11 PUTNAM AV            ( 122,  44)            HARVARD SQ                ( 101,   47)

  23      SRA13                      1     1    11.083     23.033     1
          50 RIVER ST             ( 146,  38)            HARVARD SQ                ( 101,   47)

  25      SRA15                      1     1    11.083     20.333     1
          370 GREEN ST            ( 148,  44)            HARVARD SQ                ( 101,   47)

  40      SR9                        1     1    30.999      0.0       1
          600 MEMORIAL DR         ( 171,   7)            HARVARD SQ                ( 101,   47)

  31      SR1                        1     1    20.916      0.0       2
          10 SMART ST             ( 175,  46)            HARVARD SQ                ( 101,   47)

  32      SR2                        1     1    20.916     25.533     2
          20 AUDREY ST            ( 173,  13)            HARVARD SQ                ( 101,   47)

  33      SR3                        1     1    20.916      0.0       2
          MIT                     ( 187,  42)            HARVARD SQ                ( 101,   47)

  29      HERMAN                     3     1    17.050     21.050     2
          10 PERRY ST             ( 202,  64)            MORSE SCHOOL              ( 156,    5)

  37      SR7                        1     1    25.950      0.0       3
          58 ALLSTON ST           ( 161,  19)            HARVARD SQ                ( 101,   47)

  41      SR10                       1     1    30.999      0.0       3
          9 KINNAIRD ST           ( 132,  42)            HARVARD SQ                ( 101,   47)

  39      SR8                        1     1    30.999      0.0       4
          100 MEMORIAL DR         ( 204,  57)            HARVARD SQ                ( 101,   47)

  42      MR. BANG                   1     2    31.766      0.0       4
          10 ERIE ST              ( 166,  23)            KENDALL SQ                ( 201,   66)

  34      SR4                        1     1    25.950      0.0       6
          35 SIDNEY ST            ( 166,  41)            HARVARD SQ                ( 101,   47)

  35      SR5                        1     1    25.950      0.0       6
          100 AUBURN ST           ( 158,  38)            HARVARD SQ                ( 101,   47)

  36      SR6                        1     1    25.950      0.0       6
          79 FRANKLIN ST          ( 169,  40)            HARVARD SQ                ( 101,   47)

  38      SMA10                      1     1    25.950      0.0       6
          50 LOPEZ ST             ( 157,  33)            MORSE SCHOOL              ( 156,    5)
 VEHICLES AND TOUR LISTS.
           ON        ADDRESS                COORDS    TYPE      TIME       CONST

VEHICLE   1 LAST POSITION X  146, Y  38 AT     23.03, CURRENT CONTENTS   2, LAST STOP MADE AT     23.03 ,
AVERAGE EARLINESS   4.620 , AVERAGE LATENESS  2.243 , CURRENT TOUR FOLLOWS:
          21       11 PUTNAM AV          ( 122,   44)  2425      32.93     -16.38
          21       HARVARD SQ            ( 101,   47)    -2      35.37     -16.38
          23       HARVARD SQ            ( 101,   47)    -2      35.87     -13.84
          25       HARVARD SQ            ( 101,   47)    -2      36.37     -13.84
          40       600 MEMORIAL DR       ( 171,    7)  3428      44.22      -5.04
          40      HARVARD SQ            ( 101,   47)     -2      52.07      -5.04

VEHICLE   2 LAST POSITION X  173, Y   13 AT     25.53, CURRENT CONTENTS    1, LAST STOP MADE AT     25.53 ,
AVERAGE EARLINESS  2.115 , AVERAGE LATENESS  1.705 , CURRENT TOUR FOLLOWS:
          29      10 PERRY ST           ( 152,   36)   3015      32.93     -14.05
          29      MORSE SCHOOL          ( 156,    5)     -1      36.28     -14.05
          33      MIT                   ( 187,   42)   3310      41.19     -14.05
          31      10 SMART ST           ( 175,   46)   3192      42.84     -14.05
          31      HARVARD SQ            ( 101,   47)     -2      50.09     -14.05
          32      HARVARD SQ            ( 101,   47)     -2      50.59     -13.78
          33      HARVARD SQ            ( 101,   47)     -2      51.09     -13.39

VEHICLE   3 LAST POSITION X  101, Y   47 AT     25.95, CURRENT CONTENTS    0, LAST STOP MADE AT     23.87 ,
AVERAGE EARLINESS  1.551 , AVERAGE LATENESS  1.557 , CURRENT TOUR FOLLOWS:
          37      58 ALLSTON ST         ( 161,   19)   1717      32.93      -0.66
          41      9 KINNAIRD ST         ( 132,   42)   3487      36.81      -0.66
          41      HARVARD SQ            ( 101,   47)     -2      40.17      -0.66
          37      HARVARD SQ            ( 101,   47)     -2      40.67      -0.66

VEHICLE   4 LAST POSITION X  156, Y    5 AT     31.00, CURRENT CONTENTS    0, LAST STOP MADE AT     25.40 ,
AVERAGE EARLINESS  1.795 , AVERAGE LATENESS  1.396 , CURRENT TOUR FOLLOWS:
          39      100 MEMORIAL DR       ( 204,   57)   1599      37.45     -14.86
          42      10 ERIE ST            ( 166,   23)   3133      42.60     -14.86
          39      HARVARD SQ            ( 101,   47)     -2      49.42     -14.86
          42      KENDALL SQ            ( 201,   66)     -2      59.21     -14.86

VEHICLE   5 LAST POSITION X  152, Y   36 AT     24.25, CURRENT CONTENTS    0, LAST STOP MADE AT     21.05 ,
AVERAGE EARLINESS  3.267 , AVERAGE LATENESS  1.948 , CURRENT TOUR FOLLOWS:

VEHICLE   6 LAST POSITION X  156, Y    5 AT     25.95, CURRENT CONTENTS    0, LAST STOP MADE AT     25.85 ,
AVERAGE EARLINESS  2.132 , AVERAGE LATENESS  3.284 , CURRENT TOUR FOLLOWS:
          34      35 SIDNEY ST          ( 166,   41)   3369      32.93     -15.24
          36      79 FRANKLIN ST        ( 169,   40)   1481      33.72     -15.24
          38      50 LOPEZ ST           ( 157,   33)   1776      35.49     -15.24
          35      100 AUBURN ST         ( 158,   38)   2248      36.45     -15.24
          35      HARVARD SQ            ( 101,   47)     -2      42.22     -15.24
          34      HARVARD SQ            ( 101,   47)     -2      42.72     -15.24
          36      HARVARD SQ            ( 101,   47)     -2      43.22     -15.24
          38      MORSE SCHOOL          ( 156,    5)     -2      50.03     -15.24

TIME =      32.966
```

```
INTERMEDIATE I/O AT TIME =      32.966 FOR RUN    1

COMPOSITE VEHICLE AVERAGE CONTENTS=  0.74 AND PER CENT TIME EMPTY= 33.22, PER CENT TIME UNASSIGNED= 13.25
  42 DEMANDS REPRESENTING     44 PASSENGERS HAVE OCCURRED WITH AN AVERAGE DISTANCE   0.95 BETWEEN ORIGIN & DESTINATION.
  28 PICKUPS AND     24 DELIVERIES HAVE BEEN MADE, WITH     18 DEMANDS (     16 OBSERVED) CURRENTLY ON THE SYSTEM.
THE MEAN OF THE INDIVIDUAL LEVELS OF SERVICE IS  2.81 WITH A VARIANCE OF 1.941
THE OVERALL WEIGHTED LEVEL OF SERVICE IS  2.63


STATISTICS FOR DEMANDS IN PRIORITY CLASS    1 :

COMPOSITE STATISTICS FOR    20 DEMANDS AND    22 PASSENGERS:
THE WEIGHTED LEVEL OF SERVICE IS  2.69

                                                   BY DEMAND                                        BY PASSENGER
                              WAITING TIME      TRAVEL TIME       TOTAL TIME      WAITING TIME      TRAVEL TIME      TOTAL TIME
MEAN                              7.667            5.455            13.121           7.023             5.288           12.310
VARIANCE                         17.225           24.630            21.261          19.805            22.670           25.906
NORMALIZED MEAN                   0.511            0.419             1.100           0.468             0.410            1.035
WEIGHTED NORMALIZED MEAN          0.511            0.439             1.102           0.468             0.469            1.137
NO. OF CONSTRAINT VIOLATIONS      0                2                13               0                 2               13
NORMALIZED VIOLATION TIME         0.0              0.014             0.192           0.0               0.013            0.175
MAXIMUM                          13.033           17.483            19.716
MINIMUM                           0.583            0.167             4.200
NORMALIZED MAXIMUM                0.869            1.169             1.778
NORMALIZED MINIMUM                0.039            0.017             0.386
AVERAGE DEVIATION IN PICKUP TIMES   4.683 ,VARIANCE     5.943
AVERAGE DEVIATION IN DELIVERY TIMES   3.686 ,VARIANCE    3.181
THE MEAN TRAVEL RATIO IS 1.139

THE MEAN MEASURE OF SERVICE (WITH ACCESS = 4.00 MIN.) IS 1.43 WITH A MAXIMUM VALUE OF 2.43 , A VARIANCE OF 0.27 ,
          AND AN R.M.S. MEASURE OF SERVICE OF    1.52


                                                  STATISTICS BY TRIP LENGTHS (IN MILES)

                              0-1         1-2         2-3         3-4         4-5         5-6         6-7         7-8         8-

TRIPS                         14           8           0           0           0           0           0           0           0

MEAN LEVEL OF SERVICE        3.03        2.61        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)              3.0         0.1         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN WAITING TIME            5.59        9.52        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)             16.2        16.2         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN TRAVEL RATIO            1.22        1.00        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)              0.7         0.7         0.0         0.0         0.0         0.0         0.0         0.0         0.0


STATISTICS FOR DEMANDS IN PRIORITY CLASS    2 :

COMPOSITE STATISTICS FOR     1 DEMANDS AND     1 PASSENGERS:
THE WEIGHTED LEVEL OF SERVICE IS  1.22

                                                   BY DEMAND                                        BY PASSENGER
                              WAITING TIME      TRAVEL TIME       TOTAL TIME      WAITING TIME      TRAVEL TIME      TOTAL TIME
MEAN                              1.567            4.000             5.567           1.567             4.000            5.567
VARIANCE                         -0.0             -0.0              -0.0            -0.0              -0.0             -0.0
NORMALIZED MEAN                   0.157            0.465             0.687           0.157             0.465            0.687
[illegible]GHTED NORMALIZED MEAN          0.157            0.465             0.687           0.157             0.465            0.687
```

```
NO. OF CONSTRAINT VIOLATIONS      0           0           0           0           0           0
NORMALIZED VIOLATION TIME         0.0         0.0         0.0         0.0         0.0         0.0
MAXIMUM                           1.567       4.000       5.567
MINIMUM                           1.567       4.000       5.567
NORMALIZED MAXIMUM                0.157       0.465       0.687
NORMALIZED MINIMUM                0.157       0.465       0.687
AVERAGE DEVIATION IN PICKUP TIMES   2.753 ,VARIANCE  -0.0
AVERAGE DEVIATION IN DELIVERY TIMES   3.175 ,VARIANCE  -0.0
THE MEAN TRAVEL RATIO IS 1.020

THE MEAN MEASURE OF SERVICE (WITH ACCESS = 4.00 MIN.) IS 0.70 WITH A MAXIMUM VALUE OF 0.70 , A VARIANCE OF 0.0  ,
          AND AN R.M.S. MEASURE OF SERVICE OF   0.70


                                                        STATISTICS BY TRIP LENGTHS (IN MILES)

                                  0-1         1-2         2-3         3-4         4-5         5-6         6-7         7-8         8-

TRIPS                              1           0           0           0           0           0           0           0           0

MEAN LEVEL OF SERVICE             1.42        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                   -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN WAITING TIME                 1.57        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                   -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN TRAVEL RATIO                 1.02        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                   -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0


STATISTICS FOR DEMANDS IN PRIORITY CLASS   3 :


THE VEHICLE PRODUCTIVITY (PASSENGER-MILE PER VEHICLE-HOUR) IS   13.59
THE VEHICLE PRODUCTIVITY (PASSENGER TRIPS PER VEHICLE-HOUR) IS   14.26
THE MAXIMUM AMOUNT OF POOL IN USE AT ONE TIME WAS  3506 WORDS
   18 DEMANDS ON THE SYSTEM
THE MEAN LEVEL OF SERVICE IS  2.81
THE WEIGHTED LEVEL OF SERVICE IS  2.63
```

APPENDIX J

The Job Stream Employed for Restart from an Intermediate Term Failure During Scenario I. 2.6

```
FILE: CARD     TWO      P1

// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00F'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// ASSGN SYS008,X'130'
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02F'
// ASSGN SYS024,X'0FF'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000
DOWN
TIME  10
   1   4
   2   3
   3   4
   4   3
   6   2
QUIT
VEHI   1
0199   2P 800 MASS AV
    NSTP
0200   1P LAFAYETTE SQ
0200   1D HARVARD SQ
0199   2D HARVARD SQ
VEHI   2
    ESTP
0500   1P 100 MASS AV
0500   1D 11 DUNSTER ST
VEHI   3
0202   2D HARVARD SQ
    OSTP
0204   1P 23 GREEN ST
0204   1D 54 PUTNAM AV
VEHI   4
```

```
     NSTP
 0201   1D 30 MT.AUBURN ST
 VEHI   6
 0315   1P HARVARD SQ
     NSTP
 0315   1D CARS
 QUIT
     SMA1                     MIT
                        <F             &
     SMA2                     HARVARD SQ
                        <              &



FILE: CARD     TWO      P1

    SMA3                     5 WADSWORTH ST
                      (                &
    SMA4                     2 FRONT ST
                      (
    SMA5                     700 GREEN ST
                      +
    SMA6                     10 COWPERTHWAITE ST
                      +                0
    SMA7                     100 AUBURN ST
                      |                0
    SMA8                     10 COTTAGE ST
                      |
    SMA9                     CENTRAL SQ
                      |
    SMA10                    50 LOPEZ ST
                      &
/*
/*
/*
/&
```

APPENDIX K

Full Statistical Output
From Scenario I. 2.6

```
  // JOB RUN THE CARS SYSTEM
  // ASSGN SYS002,X'00C'
  // ASSGN SYS005,X'00E'
  // ASSGN SYS006,X'13C'
  // ASSGN SYS007,X'130'
  // ASSGN SYS008,X'130'
  // ASSGN SYS003,X'130'
  // ASSGN SYS004,X'130'
  // DLBL IJSYS03,'CARS DUMPING FILE1',99/365
  // EXTENT SYS003,234079,1,,3820,60
  // DLBL IJSYS04,'CARS DUMPING FILE2',99/365
  // EXTENT SYS004,234079,1,,3880,60
  // ASSGN SYS010,X'033'
  // ASSGN SYS011,X'034'
  // ASSGN SYS012,X'032'
  // ASSGN SYS013,X'031'
  // ASSGN SYS014,X'02E'
  // ASSGN SYS024,X'0FE'
  // PAUSE BEFORE RUNNING THE SYSTEM
  // EXEC SUPRCOD

  TABLES BUILT
  WARMSTART, COLDSTART OR NEWDATA?
  RESTART SUCCESSFUL USING BACKUP FILE  4, THE TIME IS     31.77
  DEMAND NUMBER    42 LAST ASSIGNED


  RUN NUMBER  1 WITH   5 BLOCKS OF HISTORY AT TIME    0.0
PLEASE ENTER YOUR NAME

    ACCEPTANCE TEST INPUT EILE SIX
THANK YOU


         SIMULATION INPUT DATA

  VEHICLE CHARACTERISTICS

 6 VEHICLES OE CAPACITY  10

SPEED: 4.00 (MINUTES PER MILE)



TRANSACTIONS BEING WRITTEN

THERE ARE     0 DISPATCHING POINTS AND     0 DISTINCT DESTINATIONS

     SERVICE CHARACTERISTICS:

 0.0 MINUTES PICKUP AND DELIVERY TIME PER PASSENGER
THERE ARE    3  PRIORITIES OE SERVICE


EOR PRIORITY CLASS    1:
  15.0 WAITING TIME CONSTRAINT (MINS)
   1.5*STRGHT +    5.0 TRAVEL TIME CONSTRAINT (MINS)
   1.5*STRGHT +    5.0 TOTAL TIME CONSTRAINT (MINS)
 DEMANDS IN THIS PRIORITY CLASS ARE GENERATED    0.400   FRACTION OE THE TIME


EOR PRIORITY CLASS    2:
  10.0 WAITING TIME CONSTRAINT (MINS)
   1.3*STRGHT +    3.0 TRAVEL TIME CONSTRAINT (MINS)
   1.3*STRGHT +    3.0 TOTAL TIME CONSTRAINT (MINS)
 DEMANDS IN THIS PRIORITY CLASS ARE GENERATED    0.300   FRACTION OF THE TIME


EOR PRIORITY CLASS    3:
   5.0 WAITING TIME CONSTRAINT (MINS)
   1.3*STRGHT +    5.0 TRAVEL TIME CONSTRAINT (MINS)
   1.3*STRGHT +   10.0 TOTAL TIME CONSTRAINT (MINS)
 DEMANDS IN THIS PRIORITY CLASS ARE GENERATED    0.300   FRACTION OF THE TIME
  ALGORITHM OPTIONS SPECIFIED:

STATISTICS WILL BE TAKEN FOR DEMANDS  ARISING BETWEEN    0. AND 999. (MINS)
MINIMUM TRIP 0.50 MILES
DISTANCE ADJUSTMENT 1.20*STRGHT
MINIMUM ALLOWED VALUE OF LINK FACTOR 0.0  (PER CENT)
```

```
   25 INITIAL DEMANDS
 ACCESS TIME (IN MINUTES)  4.00
 MILES PER UNIT  0.0190
 OBJECTIVE FUNCTION:   7 REQUESTED AT TIME   0.0
 ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
 OBJECT = ARET + KIRK*DPASSN(IDEM)*GTIM(1)
  MONITORING: EVENTS 1 DEMANDS 1 VEHICLES 1
 ASSIGNMENT TIME FOR STANDING REQUESTS:       4.100
 MAXIMUM EARLINESS ALLOWED AT TIME OF ASSIGNMENT FOR STANDING REQUESTS:      1.000

 [illegible]UM NUMBERS ALLOWED DURING COURSE OF RUN:


VEHICLES      DISPATCHING POINTS       STATIONS      SEEDS      DISTRIBUTIONS
  20               20                    20            20             20

THE AMOUNT OF POOL (IN WORDS) USED THUS FAR:

VEHICLES      DISPATCHING POINTS       STATIONS      SEEDS      DISTRIBUTIONS      GEOGRAPHICS
 1180              41                    61            39             80                 0
THIS LEAVES A TOTAL OF  11099 WORDS OUT OF THE ORIGINAL POOL OF  12500


          SIMULATION INPUT DATA

   VEHICLE CHARACTERISTICS

  6 VEHICLES OF CAPACITY  10

INPUT DATA READ AND WRITTEN
VEHICLE   1 INITIALLY AT MIT                    WITH COORDINATES X= 187 Y=  42
VEHICLE   2 INITIALLY AT 12 CENTRAL SQ          WITH COORDINATES X= 150 Y=  46
VEHICLE   3 INITIALLY AT KENDALL SQ             WITH COORDINATES X= 201 Y=  66
VEHICLE   4 INITIALLY AT B.U. BRIDGE            WITH COORDINATES X= 191 Y=  36
VEHICLE   5 INITIALLY AT 14 PLYMPTON ST         WITH COORDINATES X= 110 Y=  47
VEHICLE   6 INITIALLY AT 344 RIVER ST           WITH COORDINATES X= 135 Y=  19
INITIALIZATION COMPLETE




     SYSTEM STATUS AT TIME     0.0    FOR RUN    1

              ACTIVE DEMAND LIST
  ON            NAME               NUM  PRTY  ORGTIME   PICTIME    VEH

 VEHICLES AND TOUR LISTS.
             ON        ADDRESS                 COORDS     TYPE      TIME       CONST

VEHICLE   1 LAST POSITION X  187, Y   42 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:

VEHICLE   2 LAST POSITION X  150, Y   46 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:

VEHICLE   3 LAST POSITION X  201, Y   66 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:

VEHICLE   4 LAST POSITION X  191, Y   36 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:

VEHICLE   5 LAST POSITION X  110, Y   47 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:

VEHICLE   6 LAST POSITION X  135, Y   19 AT     0.0 , CURRENT CONTENTS   0, LAST STOP MADE AT      0.0
AVERAGE EARLINESS  0.0   , AVERAGE LATENESS  0.0   , CURRENT TOUR FOLLOWS:
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TIME =    0.0
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   0.0
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       1(187, 42)TO (156,  5)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS  5.2AND  10.1 OBJ= 0.20710037E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   0.0
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       2(101, 47)TO (156,  5)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS  4.5AND  11.3 OBJ= 0.23343170E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   0.0
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       3(204, 62)TO (156,  5)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS  8.7AND  16.0 OBJ= 0.46006287E 02
DEMAND       4(101, 47)TO (144, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS  5.0AND   9.4 OBJ= 0.39277481E 02
DEMAND       5(101, 47)TO (144, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS  5.0AND   9.9 OBJ= 0.57372131E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       6(173, 45)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS  7.2AND  14.2 OBJ= 0.25685257E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       7(182, 56)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS  9.0AND  17.4 OBJ= 0.24167831E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND       8(182, 53)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS  8.8AND  18.5 OBJ= 0.21304855E 02
[illegible]TIVE FUNCTION:   9 REQUESTED AT TIME   3.98
[illegible] A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
[illegible] ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2


DEMAND       9(175, 49)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS  8.1AND  19.0 OBJ= 0.22211365E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND      10(150,  5)TO (101, 47)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS  8.9AND  15.3 OBJ= 0.23573990E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND      11(174, 41)TO (101, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 15.8AND  23.0 OBJ= 0.95048950E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   3.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2


** TIME IS      4.78 AND VEHICLE      3 HAS REACHED  A PSEUDO STOP
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND      12(173, 45)TO (156,  5)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS  9.6AND  14.6 OBJ= 0.21494217E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND      13(121, 43)TO (156,  5)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 12.0AND  17.2 OBJ= 0.32959091E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND      14(169, 40)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 10.3AND  18.5 OBJ= 0.23808167E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     15(150, 46)TO (101, 47)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS  9.8AND  14.8 OBJ= 0.24148544E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     16(148, 40)TO (101, 47)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 10.9AND  16.2 OBJ= 0.19450226E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     17(142,  6)TO (101, 47)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 10.2AND  16.4 OBJ= 0.18237366E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME   5.98
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     18(174, 41)TO (118, 41)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS  9.9AND  16.1 OBJ= 0.12090059E 03
DEMAND     19(148, 42)TO (156,  5)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 10.7AND  23.6 OBJ= 0.14726622E 03

*** THE TIME IS       8.25 VEHICLE     5HAS NO PLACE TO    GO.
DEMAND     20(182, 56)TO (156,  5)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 13.7AND  19.4 OBJ= 0.21819427E 03
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     21(122, 44)TO (101, 47)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 17.8AND  20.2 OBJ= 0.35817642E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
[illegible]ET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD

OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     22(125, 40)TO (101, 47)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 14.9AND  18.6 OBJ= 0.21837585E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     23(146, 38)TO (101, 47)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 16.2AND  21.9 OBJ= 0.26331619E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     24(118, 41)TO (101, 47)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 16.0AND  19.7 OBJ= 0.24213715E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     25(148, 44)TO (101, 47)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 16.7AND  24.0 OBJ= 0.32160278E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     26(118, 38)TO (156,  5)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 16.0AND  27.8 OBJ= 0.34067307E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     27(158, 38)TO (156,  5)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 16.9AND  20.4 OBJ= 0.27198624E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  11.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  16.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     28(152, 34)TO (156,  5)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 24.7AND  27.9 OBJ= 0.56473495E 02
OBJECTIVE FUNCTION:   9 REQUESTED AT TIME  16.08
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     29(202, 64)TO (156,  5)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 31.6AND  38.9 OBJ= 0.10493821E 04
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*** THE TIME IS      18.67 VEHICLE     6HAS NO PLACE TO     GO.
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  20.92
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     30(150, 46)TO (156,  5)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 25.4AND  29.7 OBJ= 0.39062958E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  20.92
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     31(175, 46)TO (101, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 29.2AND  36.5 OBJ= 0.66029724E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  20.92
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     32(173, 13)TO (101, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 26.8AND  38.1 OBJ= 0.44018036E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  20.92
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     33(187, 42)TO (101, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 30.2AND  40.1 OBJ= 0.72787262E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  20.92
     = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
       = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2

*** THE TIME IS      23.87 VEHICLE     3HAS NO PLACE TO     GO.
DEMAND     29(202, 64)TO (156,  5)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 28.1AND  31.4 OBJ= 0.31440582E 02
VEHICLE  5 BROKEN DOWN: TIME    24.25 LOCATION  152,  36 NO. ACTIVE DEMANDS  1

*** THE TIME IS      25.40 VEHICLE     4HAS NO PLACE TO     GO.

*** THE TIME IS      25.85 VEHICLE     6HAS NO PLACE TO     GO.
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     34(166, 41)TO (101, 47)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 29.4AND  35.8 OBJ= 0.46584320E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     35(158, 38)TO (101, 47)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 30.6AND  36.4 OBJ= 0.38981461E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     36(169, 40)TO (101, 47)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 30.1AND  38.4 OBJ= 0.42035507E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     37(161, 19)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 32.0AND  38.5 OBJ= 0.55555908E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     38(157, 33)TO (156,  5)ASSIGNED TO VEHICLE  6.
EXPECTED ARRIVALS 31.9AND  46.5 OBJ= 0.61769653E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  25.95
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  31.00
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     39(204, 57)TO (101, 47)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 37.5AND  47.4 OBJ= 0.70302231E 02
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  31.00
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     40(171,  7)TO (101, 47)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 42.8AND  50.6 OBJ= 0.12698044E 03
OBJECTIVE FUNCTION:    9 REQUESTED AT TIME  31.00
ARET = A*(TNDELV(INP)+1)*ALONGP + B*(TNDELV(IND)+1)*ALONGD
OBJECT = ARET + DPASSN(IDEM)*GTIM(1) + (DSRTME(IDEM) - PTIM(1)**2
DEMAND     41(132, 42)TO (101, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 35.9AND  39.2 OBJ= 0.42375015E 02
DEMAND     42(166, 23)TO (201, 66)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 42.6AND  59.2 OBJ= 0.18881301E 04
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     SYSTEM STATUS AT TIME    31.766 FOR RUN    1

            ACTIVE DEMAND LIST
   ON           NAME                  NUM   PRTY  ORGTIME    PICTIME    VEH

   21       SRA11                        1     1    11.083       0.0       1
            11 PUTNAM AV              ( 122,   44)             HARVARD SQ              ( 101,   47)

   23       SRA13                        1     1    11.083      23.033     1
            50 RIVER ST               ( 146,   38)             HARVARD SQ              ( 101,   47)

   25       SRA15                        1     1    11.083      20.333     1
            370 GREEN ST              ( 148,   44)             HARVARD SQ              ( 101,   47)

   40       SR9                          1     1    30.999       0.0       1
            600 MEMORIAL DR           ( 171,    7)             HARVARD SQ              ( 101,   47)

   31       SR1                          1     1    20.916       0.0       2
            10 SMART ST               ( 175,   46)             HARVARD SQ              ( 101,   47)

   32       SR2                          1     1    20.916      25.533     2
            20 AUDREY ST              ( 173,   13)             HARVARD SQ              ( 101,   47)

   33       SR3                          1     1    20.916       0.0       2
            MIT                       ( 187,   42)             HARVARD SQ              ( 101,   47)

   29       HERMAN                       3     1    17.050      21.050     2
            10 PERRY ST               ( 202,   64)             MORSE SCHOOL            ( 156,    5)

   37       SR7                          1     1    25.950       0.0       3
            58 ALLSTON ST             ( 161,   19)             HARVARD SQ              ( 101,   47)

   41       SR10                         1     1    30.999       0.0       3
            9 KINNAIRD ST             ( 132,   42)             HARVARD SQ              ( 101,   47)

   39       SR8                          1     1    30.999       0.0       4
            100 MEMORIAL DR           ( 204,   57)             HARVARD SQ              ( 101,   47)

   42       MR. BANG                     1     2    31.766       0.0       4
            10 ERIE ST                ( 166,   23)             KENDALL SQ              ( 201,   66)

   34       SR4                          1     1    25.950       0.0       6
            35 SIDNEY ST              ( 166,   41)             HARVARD SQ              ( 101,   47)

   35       SR5                          1     1    25.950       0.0       6
            100 AUBURN ST             ( 158,   38)             HARVARD SQ              ( 101,   47)

   36       SR6                          1     1    25.950       0.0       6
            79 FRANKLIN ST            ( 169,   40)             HARVARD SQ              ( 101,   47)

   38       SMA10                        1     1    25.950       0.0       6
            50 LOPEZ ST               ( 157,   33)             MORSE SCHOOL            ( 156,    5)

  VEHICLES AND TOUR LISTS.
           ON        ADDRESS                  COORDS     TYPE      TIME       CONST

VEHICLE   1 LAST POSITION X  146, Y   38 AT     23.03, CURRENT CONTENTS   2, LAST STOP MADE AT     23.03 ,
AVERAGE EARLINESS  4.620 , AVERAGE LATENESS  2.243 , CURRENT TOUR FOLLOWS:
           21       11 PUTNAM AV          ( 122,   44)  1320      31.50     -14.95
           21       HARVARD SQ            ( 101,   47)    -1      33.93     -14.95
           23       HARVARD SQ            ( 101,   47)    -1      34.43     -12.41
           25       HARVARD SQ            ( 101,   47)    -1      34.93     -12.41
           40       600 MEMORIAL DR       ( 171,    7)  1497      42.79      -3.61
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          40     HARVARD SQ           ( 101,  47)    -1      50.64     -3.61

VEHICLE   2 LAST POSITION X  173, Y   13 AT    25.53, CURRENT CONTENTS   1, LAST STOP MADE AT    25.53 ,
AVERAGE EARLINESS  2.115 , AVERAGE LATENESS  1.705 , CURRENT TOUR FOLLOWS:
          29     10 PERRY ST          ( 152,  36)  1733      28.87     -9.99
          29     MORSE SCHOOL         ( 156,   5)    -1      32.22     -9.99
          33     MIT                  ( 187,  42)  1674      37.13     -9.99
          31     10 SMART ST          ( 175,  46)  1556      38.78     -9.99
          31     HARVARD SQ           ( 101,  47)    -1      46.03     -9.99
          32     HARVARD SQ           ( 101,  47)    -1      46.53     -9.72
          33     HARVARD SQ           ( 101,  47)    -1      47.03     -9.33

VEHICLE   3 LAST POSITION X  101, Y   47 AT    25.95, CURRENT CONTENTS   0, LAST STOP MADE AT    23.87 ,
AVERAGE EARLINESS  1.551 , AVERAGE LATENESS  1.557 , CURRENT TOUR FOLLOWS:
          37     58 ALLSTON ST        ( 161,  19)  1792      31.99      0.28
          41     9 KINNAIRD ST        ( 132,  42)  1851      35.86      0.28
          41     HARVARD SQ           ( 101,  47)    -1      39.23      0.28
          37     HARVARD SQ           ( 101,  47)    -1      39.73      0.28

VEHICLE   4 LAST POSITION X  156, Y    5 AT    31.00, CURRENT CONTENTS   0, LAST STOP MADE AT    25.40 ,
AVERAGE EARLINESS  1.795 , AVERAGE LATENESS  1.396 , CURRENT TOUR FOLLOWS:
          39     100 MEMORIAL DR      ( 204,  57)  1910      37.45    -14.86
          42     10 ERIE ST           ( 166,  23)  1969      42.60    -14.86
          39     HARVARD SQ           ( 101,  47)    -1      49.42    -14.86
          42     KENDALL SQ           ( 201,  66)    -1      59.21    -14.86

VEHICLE   5 LAST POSITION X  152, Y   36 AT    24.25, CURRENT CONTENTS   0, LAST STOP MADE AT    21.05 ,
AVERAGE EARLINESS  3.267 , AVERAGE LATENESS  1.948 , CURRENT TOUR FOLLOWS:

VEHICLE   6 LAST POSITION X  156, Y    5 AT    25.95, CURRENT CONTENTS   0, LAST STOP MADE AT    25.85 ,
AVERAGE EARLINESS  2.132 , AVERAGE LATENESS  3.284 , CURRENT TOUR FOLLOWS:
          34     35 SIDNEY ST         ( 166,  41)  2028      29.36    -11.67
          36     79 FRANKLIN ST       ( 169,  40)  2146      30.15    -11.67
          38     50 LOPEZ ST          ( 157,  33)  2205      31.91    -11.67
          35     100 AUBURN ST        ( 158,  38)  2087      32.88    -11.67
          35     HARVARD SQ           ( 101,  47)    -1      38.64    -11.67
          34     HARVARD SQ           ( 101,  47)    -1      39.14    -11.67
          36     HARVARD SQ           ( 101,  47)    -1      39.64    -11.67
          38     MORSE SCHOOL         ( 156,   5)    -1      46.45    -11.67
41.77 CRS0065SUCCESSFUL REPAIR   TRANSFER TO SYSON
```

```
// JOB RUN THE CARS SYSTEM
// ASSGN SYS002,X'00C'
// ASSGN SYS005,X'00E'
// ASSGN SYS006,X'130'
// ASSGN SYS007,X'130'
// ASSGN SYS008,X'130'
// ASSGN SYS003,X'130'
// ASSGN SYS004,X'130'
// DLBL IJSYS03,'CARS DUMPING FILE1',99/365
// EXTENT SYS003,234079,1,,3820,60
// DLBL IJSYS04,'CARS DUMPING FILE2',99/365
// EXTENT SYS004,234079,1,,3880,60
// ASSGN SYS010,X'033'
// ASSGN SYS011,X'034'
// ASSGN SYS012,X'032'
// ASSGN SYS013,X'031'
// ASSGN SYS014,X'02F'
// ASSGN SYS024,X'0FF'
// PAUSE BEFORE RUNNING THE SYSTEM
// EXEC SUPR000

TABLES BUILT
WARMSTART, COLDSTART OR NEWDATA?
```

```
         SYSTEM STATUS AT TIME    41.766 FOR RUN    1

                ACTIVE DEMAND LIST
    DN            NAME                 NUM   PRTY  ORGTIME    PICTIME    VEH

    40       SR9                          1     1    30.999       0.0        1
             600 MEMORIAL DR        ( 171,    7)             HARVARD SQ             ( 101,   47) .

    31       SR1                          1     1    20.916       0.0        2
             10 SMART ST            ( 175,   46)             HARVARD SQ             ( 101,   47)

    32       SR2                          1     1    20.916     25.533       2
             20 AUDREY ST           ( 173,   13)             HARVARD SQ             ( 101,   47)

    33       SR3                          1     1    20.916     41.766       2
             MIT                    ( 187,   42)             HARVARD SQ             ( 101,   47)

    42       MR. BANG                     1     2    31.766     41.766       4
             10 ERIE ST             ( 166,   23)             KENDALL SQ             ( 201,   66)

    34       SR4                          1     1    25.950     41.766       6
             35 SIDNEY ST           ( 166,   41)             HARVARD SQ             ( 101,   47)

    35       SR5                          1     1    25.950       0.0        6
             100 AUBURN ST          ( 158,   38)             HARVARD SQ             ( 101,   47)

    36       SR6                          1     1    25.950     41.766       6
             79 FRANKLIN ST         ( 169,   40)             HARVARD SQ             ( 101,   47)

    38       SMA10                        1     1    25.950       0.0        6
             50 LOPEZ ST            ( 157,   33)             MORSE SCHOOL           ( 156,    5)

  VEHICLES AND TOUR LISTS.
               DN        ADDRESS                  COORDS      TYPE       TIME       CONST

VEHICLE   1 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   0, LAST STOP MADE AT    41.77 ,
AVERAGE EARLINESS  4.620 , AVERAGE LATENESS  2.243 , CURRENT TOUR FOLLOWS:
               40       600 MEMORIAL DR         ( 171,    7) 1497       42.79      -3.61
               40       HARVARD SQ              ( 101,   47)   -1       50.64      -3.61

VEHICLE   2 LAST POSITION X  187, Y   42 AT    41.77, CURRENT CONTENTS   2, LAST STOP MADE AT    41.77 ,
AVERAGE EARLINESS  2.115 , AVERAGE LATENESS  1.705 , CURRENT TOUR FOLLOWS:
               31       10 SMART ST             ( 175,   46) 1556       38.78      -9.99
               31       HARVARD SQ              ( 101,   47)   -1       46.03      -9.99
               32       HARVARD SQ              ( 101,   47)   -1       46.53      -9.72
               33       HARVARD SQ              ( 101,   47)   -1       47.03      -9.33

VEHICLE   3 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   0, LAST STOP MADE AT    41.77 ,
AVERAGE EARLINESS  1.551 , AVERAGE LATENESS  1.557 , CURRENT TOUR FOLLOWS:

VEHICLE   4 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   1, LAST STOP MADE AT    41.77 ,
AVERAGE EARLINESS  1.795 , AVERAGE LATENESS  1.396 , CURRENT TOUR FOLLOWS:
               42       KENDALL SQ              ( 201,   66)   -1       59.21     -14.86

VEHICLE   5 LAST POSITION X  152, Y   36 AT    24.25, CURRENT CONTENTS   0, LAST STOP MADE AT    21.05 ,
AVERAGE EARLINESS  3.267 , AVERAGE LATENESS  1.948 , CURRENT TOUR FOLLOWS:

VEHICLE   6 LAST POSITION X  169, Y   40 AT    41.77, CURRENT CONTENTS   2, LAST STOP MADE AT    41.77 ,
AVERAGE EARLINESS  2.132 , AVERAGE LATENESS  3.284 , CURRENT TOUR FOLLOWS:
               38       50 LOPEZ ST             ( 157,   33) 2205       31.91     -11.67
               35       100 AUBURN ST           ( 158,   38) 2087       32.88     -11.67
               35       HARVARD SQ              ( 101,   47)   -1       38.64     -11.67
               34       HARVARD SQ              ( 101,   47)   -1       39.14     -11.67
               36     HARVARD SQ          ( 101,   47)     -1      39.64     -11.67
               38     MORSE SCHOOL        ( 156,    5)     -1      46.45     -11.67
    DEMAND 0200 IS ADDED TO THE TOUR
    DEMAND 0199 IS ADDED TO THE TOUR
    TOUR COMPLETE FOR VEHICLE  1
    DEMAND 0500 IS ADDED TO THE TOUR
    TOUR COMPLETE FOR VEHICLE  2
    DEMAND 0204 IS ADDED TO THE TOUR
    TOUR COMPLETE FOR VEHICLE  3
    DEMAND 0201 IS ADDED TO THE TOUR
    TOUR COMPLETE FOR VEHICLE  4
    DEMAND 0315 IS ADDED TO THE TOUR
    TOUR COMPLETE FOR VEHICLE  6
    41.77 CRS0084  SYSDN COMPLETE     NORMAL OPERATION MAY BEGIN

     SYSTEM STATUS AT TIME    41.766 FOR RUN    1

           ACTIVE DEMAND LIST
  DN          NAME                  NUM  PRTY  ORGTIME   PICTIME    VEH

  40     SR9                          1    1   30.999     0.0       1
         600 MEMORIAL DR          ( 171,   7)          HARVARD SQ            ( 101,   47)

 200     0200                         1    1   41.766     0.0       1
         LAFAYETTE SQ             ( 163,  45)          HARVARD SQ            ( 101,   47)

 199     0199                         2    1   41.766    41.766     1
                                  (   0,   0)          HARVARD SQ            ( 101,   47)

  31     SR1                          1    1   20.916     0.0       2
         10 SMART ST              ( 175,  46)          HARVARD SQ            ( 101,   47)

  32     SR2                          1    1   20.916    25.533     2
         20 AUDREY ST             ( 173,  13)          HARVARD SQ            ( 101,   47)

  33     SR3                          1    1   20.916    41.766     2
         MIT                      ( 187,  42)          HARVARD SQ            ( 101,   47)

 500   · 0500                         1    1   41.766     0.0       2
         100 MASS AV              ( 187,  42)          11 DUNSTER ST         ( 103,   45)

 204     0204                         1    1   41.766     0.0       3
         23 GREEN ST              ( 170,  42)          54 PUTNAM AV          ( 125,   40)

  42     MR. BANG                     1    2   31.766    41.766     4
         10 ERIE ST               ( 166,  23)          KENDALL SQ            ( 201,   66)

 201     0201                         1    1   41.766    41.766     4
                                  (   0,   0)          30 MT.AUBURN ST       ( 114,   44)

  34     SR4                          1    1   25.950    41.766     6
         35 SIDNEY ST             ( 166,  41)          HARVARD SQ            ( 101,   47)

  35     SR5                          1    1   25.950     0.0       6
         100 AUBURN ST            ( 158,  38)          HARVARD SQ            ( 101,   47)

  36     SR6                          1    1   25.950    41.766     6
         79 FRANKLIN ST           ( 169,  40)          HARVARD SQ            ( 101,   47)

  38     SMA10                        1    1   25.950     0.0       6
         50 LOPEZ ST              ( 157,  33)          MORSE SCHOOL          ( 156,    5)

 315     0315                         1    1   41.766    41.766     6
                                  (   0,   0)          CARS                  ( 200,   62)

 VEHICLES AND TOUR LISTS.
         DN        ADDRESS                 COORDS     TYPE      TIME       CONST

VEHICLE   1 LAST POSITION X  144, Y   47 AT    41.77, CURRENT CONTENTS   2, LAST STOP MADE AT     41.77
AVERAGE EARLINESS   4.620 , AVERAGE LATENESS  2.243 , CURRENT TOUR FOLLOWS:
          40      600 MEMORIAL DR       ( 171,   7)  1497       42.79      10.00
         200      LAFAYETTE SQ          ( 163,  45)  1910       47.33      10.00
          40      HARVARD SQ            ( 101,  47)    -1       53.99      10.00
         200      HARVARD SQ            ( 101,  47)    -1       54.99      10.00
         199      HARVARD SQ            ( 101,  47)    -1       55.99      10.00

VEHICLE   2 LAST POSITION X  187, Y   42 AT    41.77, CURRENT CONTENTS   2, LAST STOP MADE AT     41.77
AVERAGE EARLINESS   2.115 , AVERAGE LATENESS  1.705 , CURRENT TOUR FOLLOWS:
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            500      100 MASS AV          ( 187,  42)  1851      42.77      10.00
             31      10 SMART ST          ( 175,  46)  1556      44.92      10.00
            500      11 DUNSTER ST        ( 103,  45)    -1      52.49      10.00
             31      HARVARD SQ           ( 101,  47)    -1      53.74      10.00
             32      HARVARD SQ           ( 101,  47)    -1      54.74      10.00
             33      HARVARD SQ           ( 101,  47)    -1      55.74      10.00

VEHICLE   3 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   0, LAST STOP MADE AT     41.77 ,
AVERAGE EARLINESS  1.551 , AVERAGE LATENESS  1.557 , CURRENT TOUR FOLLOWS:
            204      23 GREEN ST          ( 170,  42)  1733      42.77      10.00
            204      54 PUTNAM AV         ( 125,  40)    -1      47.87      10.00

VEHICLE   4 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   2, LAST STOP MADE AT     41.77 ,
AVERAGE EARLINESS  1.795 , AVERAGE LATENESS  1.396 , CURRENT TOUR FOLLOWS:
             42      KENDALL SQ           ( 201,  66)    -1      59.21      10.00
            201      30 MT.AUBURN ST      ( 114,  44)    -1      68.39      10.00

VEHICLE   5 LAST POSITION X  152, Y   36 AT    24.25, CURRENT CONTENTS   0, LAST STOP MADE AT     21.05 ,
AVERAGE EARLINESS  3.267 , AVERAGE LATENESS  1.948 , CURRENT TOUR FOLLOWS:

VEHICLE   6 LAST POSITION X  101, Y   47 AT    41.77, CURRENT CONTENTS   3, LAST STOP MADE AT     41.77 ,
AVERAGE EARLINESS  2.132 , AVERAGE LATENESS  3.284 , CURRENT TOUR FOLLOWS:
             38      50 LOPEZ ST          ( 157,  33)  2205      42.77      10.00
             35      100 AUBURN ST        ( 158,  38)  2087      44.23      10.00
             35      HARVARD SQ           ( 101,  47)    -1      50.49      10.00
             34      HARVARD SQ           ( 101,  47)    -1      51.49      10.00
             36      HARVARD SQ           ( 101,  47)    -1      52.49      10.00
             38      MORSE SCHOOL         ( 156,   5)    -1      59.81      10.00
            315      CAPS                 ( 200,  62)    -1      67.37      10.00
DEMAND     49(204, 57)TO (144, 47)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 48.7AND  54.8 OBJ= 0.87559570E 02
DEMAND     50(118, 41)TO (144, 47)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 50.2AND  53.1 OBJ= 0.57180847E 02

*** THE TIME IS      44.60 VEHICLE    1HAS NO PLACE TO    GO.

*** THE TIME IS      45.55 VEHICLE    4HAS NO PLACE TO    GO.
DEMAND     51(148, 42)TO (166, 23)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 50.8AND  53.7 OBJ= 0.57674469E 02
DEMAND     52(101, 47)TO (202, 64)ASSIGNED TO VEHICLE  1.
EXPECTED ARRIVALS 52.5AND  62.4 OBJ= 0.72697281E 02
DEMAND     53(101, 47)TO (173, 45)ASSIGNED TO VEHICLE  4.
EXPECTED ARRIVALS 54.2AND  61.3 OBJ= 0.70087067E 02
DEMAND     54(101, 47)TO (172, 43)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 57.2AND  64.2 OBJ= 0.71686600E 02
VEHICLE  5 RESTORED: TIME    53.78 LOCATION  152,  36
DEMAND     55(101, 47)TO (152, 34)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 58.0AND  63.3 OBJ= 0.65978165E 02
DEMAND     56(101, 47)TO (200, 62)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 57.9AND  69.3 OBJ= 0.74387711E 02
DEMAND     57(101, 47)TO (175, 44)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 57.7AND  66.3 OBJ= 0.69327835E 02
DEMAND     58(101, 47)TO (161, 19)ASSIGNED TO VEHICLE  2.
EXPECTED ARRIVALS 57.5AND  64.9 OBJ= 0.77439178E 02


DEMAND     59(101, 47)TO (157, 30)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 61.5AND  67.3 OBJ= 0.78423172E 02
DEMAND     60(101, 47)TO (144, 28)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 62.0AND  66.8 OBJ= 0.69076859E 02
DEMAND     61(101, 47)TO (153,  9)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 62.5AND  71.4 OBJ= 0.75376511E 02

*** THE TIME IS      58.13 VEHICLE    3HAS NO PLACE TO    GO.

*** THE TIME IS      58.47 VEHICLE    1HAS NO PLACE TO    GO.
DEMAND     62(101, 47)TO (140, 28)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 64.9AND  69.3 OBJ= 0.80599991E 02

*** THE TIME IS      58.60 VEHICLE    6HAS NO PLACE TO    GO.
DEMAND     63(101, 47)TO (157, 28)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 60.5AND  67.7 OBJ= 0.70675140E 02

*** THE TIME IS      59.02 VEHICLE    4HAS NO PLACE TO    GO.
DEMAND     64(101, 47)TO (201, 66)ASSIGNED TO VEHICLE  5.
EXPECTED ARRIVALS 61.3AND  78.0 OBJ= 0.87797592E 02
DEMAND     65(101, 47)TO (132, 42)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 70.0AND  73.4 OBJ= 0.81188934E 02
DEMAND     66(101, 47)TO (170, 42)ASSIGNED TO VEHICLE  3.
EXPECTED ARRIVALS 70.2AND  77.5 OBJ= 0.82499954E 02
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      SYSTEM STATUS AT TIME     66.015 FOR RUN     1

            ACTIVE DEMAND LIST
  DN            NAME                  NUM  PRTY  ORGTIME    PICTIME    VEH

  54        MAID 3                      1    1    53.716     55.416     2
            HARVARD SQ             ( 101,   47)          7 LANSDOWNE ST        ( 172,   43)

  56        MAID 5                      1    1    54.416     56.399     2
            HARVARD SQ             ( 101,   47)          1 HAYWARD ST          ( 200,   62)

  57        MAID 6                      1    1    54.716     57.066     2
            HARVARD SQ             ( 101,   47)          SUB SHOP              ( 175,   44)

  58        MAID 7                      1    1    56.032     57.632     2
            HARVARD SQ             ( 101,   47)          57 ALLSTON ST         ( 161,   19)

  65        MR  IRIGQUOIS               1    1    65.049      0.0       3
            HARVARD SQ             ( 101,   47)          3 KINNAIRD ST         ( 132,   42)

  66        MR  SIOUX                   1    1    65.765      0.0       3
            HARVARD SQ             ( 101,   47)          10 GREEN ST           ( 170,   42)

  59        MAID 8                      1    1    56.732     58.849     5
            HARVARD SQ             ( 101,   47)          10 DECATUR ST         ( 157,   30)

  60        MAID 9                      1    1    57.432     64.649     5
            HARVARD SQ             ( 101,   47)          72 PLEASANT ST        ( 144,   28)

  61        MAID 10                     1    1    58.115     65.615     5
            HARVARD SQ             ( 101,   47)          312 PEARL ST          ( 153,    9)

  63        MAID 12                     1    1    58.999      0.0       5
            HARVARD SQ             ( 101,   47)          11 VALENTINE ST       ( 157,   28)

  64        MAID 13                     1    1    59.265      0.0       5
            HARVARD SQ             ( 101,   47)          KENDALL SQ            ( 201,   66)

 VEHICLES AND TOUR LISTS.
            DN        ADDRESS                  COORDS      TYPE      TIME       CONST

VEHICLE    1 LAST POSITION X   202, Y    64 AT     58.47, CURRENT CONTENTS    0, LAST STOP MADE AT      58.47 ,
AVERAGE EARLINESS   3.159  , AVERAGE LATENESS   1.188  , CURRENT TOUR FOLLOWS:

VEHICLE    2 LAST POSITION X   152, Y    34 AT     64.97, CURRENT CONTENTS    4, LAST STOP MADE AT      64.97 ,
AVERAGE EARLINESS   2.564  , AVERAGE LATENESS   1.196  , CURRENT TOUR FOLLOWS:
            58     57 ALLSTON ST          ( 161,   19)    -2      67.06      -1.52
            54     7 LANSDOWNE ST         ( 172,   43)    -2      69.97      -1.52
            57     SUB SHOP               ( 175,   44)    -2      70.76      -0.95
            56     1 HAYWARD ST           ( 200,   62)    -2      74.07      -0.95

VEHICLE    3 LAST POSITION X   140, Y    28 AT     65.25, CURRENT CONTENTS    0, LAST STOP MADE AT      65.25 ,
AVERAGE EARLINESS   2.283  , AVERAGE LATENESS   1.723  , CURRENT TOUR FOLLOWS:
            65     HARVARD SQ             ( 101,   47)  1733      69.71       0.78
            66     HARVARD SQ             ( 101,   47)  2834      70.21       0.78
            65     3 KINNAIRD ST          ( 132,   42)    -2      73.57       0.78
            66     10 GREEN ST            ( 170,   42)    -2      77.53       2.69

VEHICLE    4 LAST POSITION X   173, Y    45 AT     59.02, CURRENT CONTENTS    0, LAST STOP MADE AT      59.02 ,
AVERAGE EARLINESS   3.851  , AVERAGE LATENESS   1.396  , CURRENT TOUR FOLLOWS:

VEHICLE    5 LAST POSITION X   101, Y    47 AT     65.62, CURRENT CONTENTS    3, LAST STOP MADE AT      65.62 ,
AVERAGE EARLINESS   3.163  , AVERAGE LATENESS   2.666  , CURRENT TOUR FOLLOWS:


            63     HARVARD SQ             ( 101,   47)  2716      66.52      -5.56
            64     HARVARD SQ             ( 101,   47)  2775      67.02      -5.56
            60     72 PLEASANT ST         ( 144,   28)    -2      71.80      -5.56
            59     10 DECATUR ST          ( 157,   30)    -2      73.50      -5.56
            63     11 VALENTINE ST        ( 157,   28)    -2      74.18      -5.56
            61     312 PEARL ST           ( 153,    9)    -2      76.46      -5.56
            64     KENDALL SQ             ( 201,   66)    -2      83.75      -5.56

VEHICLE    6 LAST POSITION X   200, Y    62 AT     58.60, CURRENT CONTENTS    0, LAST STOP MADE AT      58.60 ,
AVERAGE EARLINESS   2.042  , AVERAGE LATENESS   1.822  , CURRENT TOUR FOLLOWS:

TIME =       66.215
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 INTERMEDIATE I/O AT TIME =      66.215 FOR RUN     1

COMPOSITE VEHICLE AVERAGE CONTENTS=  0.52 AND PER CENT TIME EMPTY= 32.24, PER CENT TIME UNASSIGNED= 19.55
  66 DEMANDS REPRESENTING     69 PASSENGERS HAVE OCCURRED WITH AN AVERAGE DISTANCE    2.06 BETWEEN ORIGIN & DESTINATION.
  30 PICKUPS AND     26 DELIVERIES HAVE BEEN MADE, WITH     40 DEMANDS (     14 OBSERVED) CURRENTLY ON THE SYSTEM.
THE MEAN OF THE INDIVIDUAL LEVELS OF SERVICE IS  2.91 WITH A VARIANCE OF 4.584
THE OVERALL WEIGHTED LEVEL OF SERVICE IS  1.32


STATISTICS FOR DEMANDS IN PRIORITY CLASS    1 :

COMPOSITE STATISTICS FOR   21 DEMANDS AND   26 PASSENGERS:
THE WEIGHTED LEVEL OF SERVICE IS  1.32

                                                 BY DEMAND                                      BY PASSENGER
                              WAITING TIME   TRAVEL TIME    TOTAL TIME   WAITING TIME    TRAVEL TIME    TOTAL TIME
MEAN                             7.151          6.992         14.143         6.471          6.572         13.043
VARIANCE                        64.917         41.670        113.534        55.005         34.586         98.289
NORMALIZED MEAN                  0.477          0.188          0.758         0.431          0.237          0.779
WEIGHTED NORMALIZED MEAN         0.477         10.707          2.271         0.431         12.459          2.593
NO. OF CONSTRAINT VIOLATIONS     6             11             14             6             12             19
NORMALIZED VIOLATION TIME        0.077         -0.555         -0.099         0.062         -0.492         -0.106
MAXIMUM                         23.983         28.983         33.866
MINIMUM                          0.0            0.367          2.650
NORMALIZED MAXIMUM               1.599          2.903          3.168
NORMALIZED MINIMUM               0.0           -6.608         -1.431
AVERAGE DEVIATION IN PICKUP TIMES  8.853 ,VARIANCE 194.547
AVERAGE DEVIATION IN DELIVERY TIMES 10.511 ,VARIANCE 267.867
THE MEAN TRAVEL RATIO IS 1.482

THE MEAN MEASURE OF SERVICE (WITH ACCESS = 4.00 MIN.) IS 1.44 WITH A MAXIMUM VALUE OF 4.27 , A VARIANCE OF 1.00 ,
          AND AN R.M.S. MEASURE OF SERVICE OF    1.75


                                        STATISTICS BY TRIP LENGTHS (IN MILES)

                            0-1         1-2         2-3         3-4         4-5         5-6         6-7         7-8         8-

TRIPS                        13          13           0           0           0           0           0           0           0

MEAN LEVEL OF SERVICE       3.32        2.54        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)              6.6         2.6         0.0         0.0         0.0         0.0         0.0         0.0         0.

MEAN WAITING TIME           3.73        9.21        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)             20.3        74.6         0.0         0.0         0.0         0.0         0.0         0.0         0.

MEAN TRAVEL RATIO           1.86        1.10        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)              1.0         1.0         0.0         0.0         0.0         0.0         0.0         0.0         0.


STATISTICS FOR DEMANDS IN PRIORITY CLASS    2 :

COMPOSITE STATISTICS FOR    1 DEMANDS AND    1 PASSENGERS:
THE WEIGHTED LEVEL OF SERVICE IS  1.19
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                                                     BY DEMAND                                       BY PASSENGER
                                    WAITING TIME    TRAVEL TIME     TOTAL TIME     WAITING TIME     TRAVEL TIME      TOTAL TIME
MEAN                                  10.000          1.750          11.750          10.000           1.750           11.750
VARIANCE                              -0.0           -0.0            -0.0            -0.0             -0.0            -0.0
NORMALIZED MEAN                        1.000          0.126           0.934           1.000           0.126            0.934
WEIGHTED NORMALIZED MEAN               1.000          0.126           0.934           1.000           0.126            0.934



NO. OF CONSTRAINT VIOLATIONS          0              0               0               0                0                0
NORMALIZED VIOLATION TIME             0.0            0.0             0.0             0.0              0.0              0.0
MAXIMUM                              10.000          1.750          11.750
MINIMUM                              10.000          1.750          11.750
NORMALIZED MAXIMUM                    1.000          0.126           0.934
NORMALIZED MINIMUM                    1.000          0.126           0.934
AVERAGE DEVIATION IN PICKUP TIMES  0.838 ,VARIANCE  -0.0
AVERAGE DEVIATION IN DELIVERY TIMES 15.690 ,VARIANCE  -0.0
THE MEAN TRAVEL RATIO IS 0.346

THE MEAN MEASURE OF SERVICE (WITH ACCESS = 4.00 MIN.) IS 1.30 WITH A MAXIMUM VALUE OF 1.30 , A VARIANCE OF 0.0
          AND AN R.M.S. MEASURE OF SERVICE OF    1.30

                                                  STATISTICS BY TRIP LENGTHS (IN MILES)

                                    0-1         1-2         2-3         3-4         4-5         5-6         6-7         7-8         8-

TRIPS                                0           1           0           0           0           0           0           0           0

MEAN LEVEL OF SERVICE               0.0         2.32        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                      0.0        -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN WAITING TIME                   0.0        10.00        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                      0.0        -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0

MEAN TRAVEL RATIO                   0.0         0.35        0.0         0.0         0.0         0.0         0.0         0.0         0.0
     (VARIANCE)                      0.0        -0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0


STATISTICS FOR DEMANDS IN PRIORITY CLASS    3 :

THE VEHICLE PRODUCTIVITY (PASSENGER-MILE PER VEHICLE-HOUR) IS     5.59
THE VEHICLE PRODUCTIVITY (PASSENGER TRIPS PER VEHICLE-HOUR) IS     2.72
THE MAXIMUM AMOUNT OF POOL IN USE AT ONE TIME WAS  2853 WORDS
   40 DEMANDS ON THE SYSTEM
THE MEAN LEVEL OF SERVICE IS  2.91
THE WEIGHTED LEVEL OF SERVICE IS  1.32
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.A37 no. DOT-
TSC-UMTA-72-1
v. 2

BORROWER

C.D. Krishna

Kenneth

for Joseph

Bechtel

Form DOT F 1720.
FORMERLY FORM DOT

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